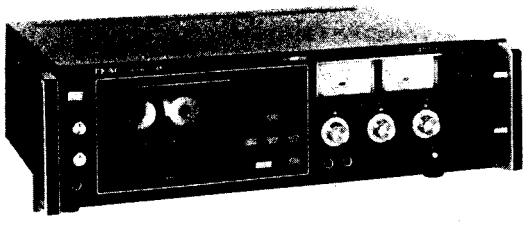
TEAC®



SERVICE MANUAL

C-3X

Stereo Cassette Deck

Effective: October, 1980 B00113

5 704006800

1 SPECIFICATIONS AND SERVICE DATA

NOTES:

1. Improvements may result in changes in specifications and service data.
2. 0 dB is referenced to 0.775 V in this manual unless otherwise specified.
3. All the electrical numeral values are for STANDARD speed unless otherwise specified.

SPECIFICATIONS

Track System 4-track, 2-channel stereo
Heads 3: Erase, record and playback
Type of Tape Cassette tape, C-60 and C-90 (Philips type)
Tape Speed 4.75 cm/s (1-7/8 ips), 9.5 cm/s (3-3/4 ips)
Input (level and impedance)
MIC: Specified input level: −57 dB (1.09 mV)/10k ohms
Minimum input level: −67 dB (346 μV)
LINE IN: Specified input level: −9 dB (275 mV)/50k ohms
Minimum input level: −19 dB (86.9 mV)
Output (level and impedance)
OUTPUT: Maximum output level: −2.5 dB (581 mV)/50k ohms
Specified output level: −5 dB (436 mV)
PHONES: Specified output level: −15.8 dB (126 mV)/8 ohms
Equalization

	HIGH	STANDARD
METAL	3180 μs + 35 μs	3180 μs + 70 μs
Co(CrO_2)	3180 μs + 35 μs	3180 μs + 70 μs
NORMAL	3180 μs + 50 μs	3180 μs + 120 μs

Head Configuration
1/2-track, 1-channel erase head
1/4-track, 2-channel record head and playback head in a single housing
Motors 1 DC servo capstan motor
1 DC reel motor
Bias Frequency 100 kHz ±5 kHz
Operation Position Horizontal
Power Requirements
100/117/220/240 V AC, 50/60 Hz, 41 W(General export model)
117 V AC, 60 Hz, 41 W(U.S.A/Canada model)
220 V AC, 50 Hz, 41 W(Europe model)
240 V AC, 50 Hz, 41 W(U.K./Australia model)
Weight 9 kg (19-3/16 lbs.) net
Dimensions See Fig. 3-2

Noise Reduction System and Headroom Extension System manufactured under license from Dolby Laboratories Licensing Corporation.
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SERVICE DATA

MECHANICAL

Tape Speed Deviation 3,000 Hz ±45 Hz
Tape Speed Drift 30 Hz
Wow and Flutter

	HIGH	STANDARD
Playback	0.065% (WRMS)	0.08% (WRMS)
Record/playback	0.18% (RMS)	0.25% (RMS)

Pinch Roller Pressure 390 g to 490 g (13.8 oz to 17.3 oz.)
Reel Torque (at STANDARD speed)
Take-up: 45 to 65 g-cm (0.625 to 0.903 oz-inch)
Supply: 3 to 8 g-cm (0.0417 to 0.111 oz-inch)
F.F. & REW: 90 to 160 g-cm (1.25 to 2.22 oz-inch)
Fast Winding Time
90 seconds for MTT-501 (C-60)

ELECTRICAL

Frequency Response
See Figs. 5-9 to 5-13.
Signal-to-noise Ratio
Playback — Better than:

	HIGH	STANDARD
METAL, Co(CrO_2)	55 dB	52 dB
NORMAL	53 dB	48 dB

Overall — Better than:

	HIGH	STANDARD
METAL, Co(CrO_2)	49 dB	48 dB
NORMAL	46 dB	45 dB

S/N is improved by 5 dB at 1 kHz and 10 dB above 5 kHz when Dolby NR* is used.
Erase Efficiency 65 dB min. at 1 kHz (measured with input 10 dB higher than the specified input level)
Channel Separation 35 dB min. at 1 kHz
Adjacent Track Crosstalk 40 dB min. at 125 Hz
Total Harmonic Distortion 2.0% or less with NORMAL, Co(CrO_2) and METAL tapes

CAUTION
⚠ Parts marked with this sign are safety critical components. They must always be replaced with identical components - refer to the TEAC Parts List and ensure exact replacement.

2 PARTS LOCATION

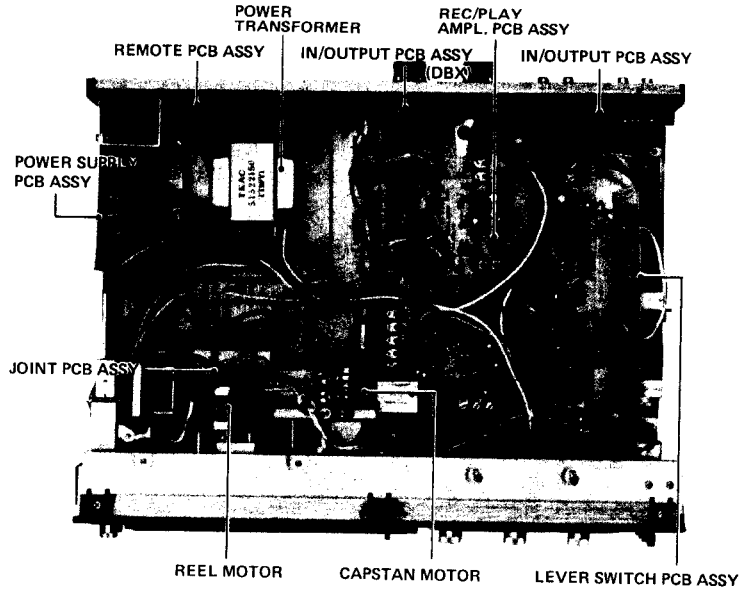


Fig. 2-1

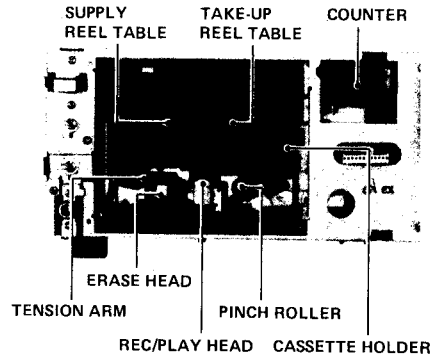


Fig. 2-2

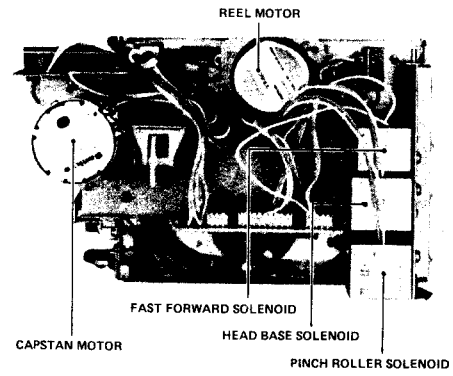


Fig. 2-3

3 REMOVAL OF EXTERNAL COMPONENTS

Disassemble in number-order

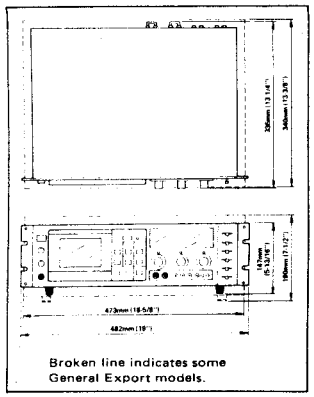
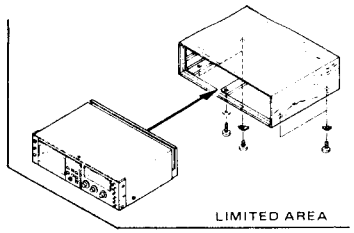


Fig. 3-2 Dimensions



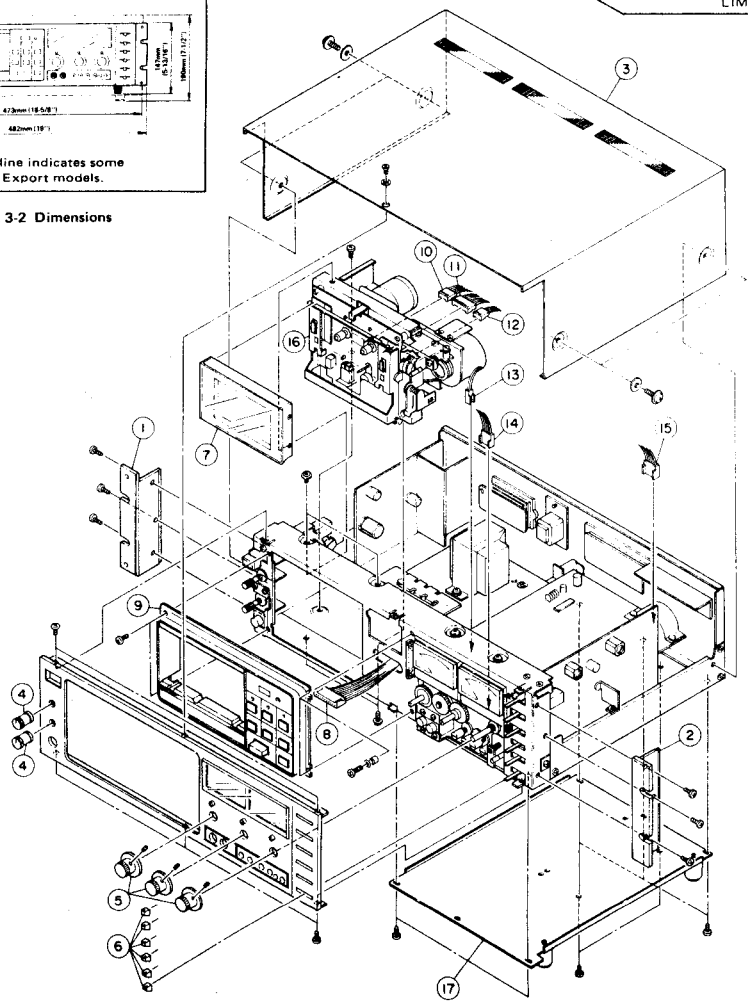


Fig. 3-1

4 MECHANICAL ADJUSTMENTS AND CHECKS

Note: All checks and adjustments are made with the SPEED switch set to STANDARD, unless otherwise indicated.

4-1 REEL TORQUE

1. Load the cassette torque meter on the deck and read the pointer indication on the dial scale for each tape transport operation. The measured torque should be within the following values:

Take-up:	45 to 65 g-cm (0.62 to 0.90 oz-inch)
Supply:	3 to 8 g-cm (0.042 to 0.11 oz-inch)
F.F. and REW:	90 to 160 g-cm (1.25 to 2.22 oz-inch)

4-2 PINCH ROLLER PRESSURE

1. With the cassette holder shut and no tape loaded, put the deck in PLAY mode.
2. Hook a spring scale on the top of the pinch roller assembly plate, as shown in the illustration.
3. Pull the scale down until there is sufficient force to separate the pinch roller from the capstan shaft.
4. Ease pressure until the pinch roller makes just enough contact with the capstan shaft so that the pinch roller just begins to turn. At this point, note the reading on the scale. It should be from 390 g to 490 g (13.8 oz. to 17.3 oz.)
5. If the pressure is not within the prescribed specifications, it may be adjusted by first removing the pinch roller spring from the pinch roller assembly and then bending the spring as shown in the illustration.

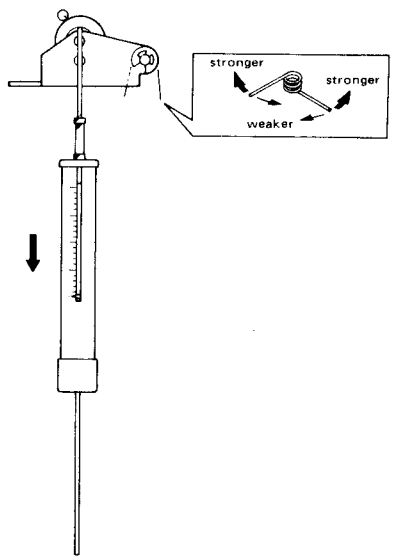


Fig. 4-1

4-3 HEAD BASE PLATE POSITIONING

1. Set the deck in the PLAY mode.
2. Push the head base plate by hand in the direction of the arrow and check that the head base plate and the stopper portion of the mechanism chassis make contact.
3. If there is any clearance, loosen the two screws on the head base plate solenoid and reposition the solenoid until the clearance is eliminated.

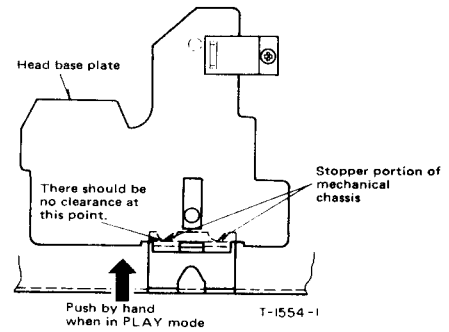

Head base plate
There should be no clearance at this point.
Stopper portion of mechanical chassis
Push by hand when in PLAY mode
T-1554-I

Fig. 4-2

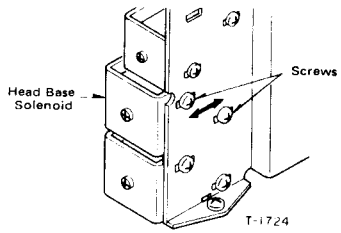


Fig. 4-3 Head base solenoid location

4-4 CAPSTAN ASSEMBLY THRUST

1. Turn the thrust adjusting screw so that thrust of the capstan shaft is within 0.05 mm to 0.15 mm.

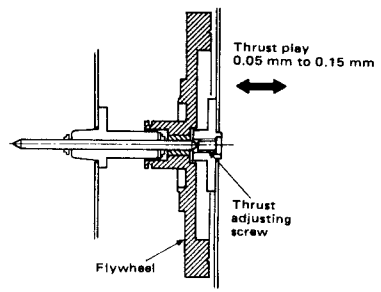


Fig. 4-4

4-5 TAPE SPEED

STANDARD speed

1. Connect a frequency counter to the deck as shown in Fig. 4-5.
2. Play a tape for about five minutes to warm up the deck, then load a TEAC MTT-111 test tape containing a 3000-Hz test tone and play the test tape from the beginning.
3. While the tape is playing, use a common slotted screwdriver with the handle completely insulated from the blade, and adjust the control on the MOTOR PCB (as far as possible) for a reading of 3000 Hz (Spec. 3000 Hz ±5 Hz) on the frequency counter.
4. Play the tape at the beginning and at the end, and check that the speed deviation is within the prescribed limits by observing that the reading on the frequency counter never deviates more than ±45 Hz from 3000 Hz, nor drifts more than 30 Hz at any given time.

HIGH speed

5. Set the deck to HIGH speed and follow all the procedures described above. Since the speed is doubled, all the values described in the preceding steps are also doubled to be compatible.
6. If the tape speed is not within the prescribed specifications, check the pinch roller pressure and the tape transport mechanism for any abnormality, and make sure the tape path is clean.

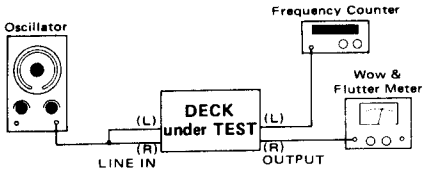


Fig. 4-5

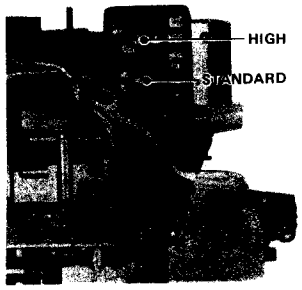


Fig. 4-6 Tape speed adjustment location

4-6 WOW AND FLUTTER

Note: These measurements should be made at the beginning, middle, and the end of the tape.

1) PLAYBACK

STANDARD Speed

1. Connect a wow-and-flutter meter to the deck as shown in Fig. 4-5.
2. Load and play a TEAC MTT-111 test tape.
3. Check that the reading on the wow-and-flutter meter is within 0.08% (WRMS).

2) SIMULTANEOUS RECORD/PLAYBACK METHOD

STANDARD Speed

4. Load a TEAC MTT-501 test tape (blank) and record a 3000-Hz signal.
5. With the MONITOR switch in the TAPE position, note the reading on the wow-and-flutter meter, it should not be more than 0.25% (RMS).

HIGH Speed

6. Repeat the above procedures with the deck set to HIGH speed. The wow and flutter should not be more than 0.18% (RMS).

3) NON-SIMULTANEOUS RECORD/PLAYBACK METHOD

STANDARD Speed

7. Rewind the tape to the beginning of the recorded section previously made in step 4, and play it at STANDARD speed.
8. The wow and flutter should not be more than 0.25% (RMS).

HIGH Speed

9. Rewind the tape to the beginning of the portion previously recorded in and play it at HIGH speed. The wow and flutter should not be more than 0.18% (RMS).

4-7 MICROSWITCH (A) ASSEMBLY CLEARANCE

1. Insert a blank cassette and close the cassette holder.
2. Loosen the two screws on the microswitch (A).
3. Move the switch so that actuator of the switch contracts the safety lever.
4. Adjust the switch position to obtain a clearance of between 0.1 mm to 0.3 mm.
5. Retighten the screws.

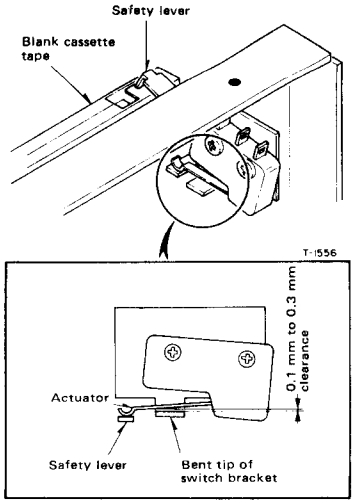


Fig. 4-7

4-8 MICROSWITCH (B) ASSEMBLY CLEARANCE

1. Push the EJECT button to open the cassette holder.
2. Loosen the two screws on the microswitch (B).
3. Move the switch so that switch actuator contacts the bent projecting portion of the eject lever.
4. Adjust the switch position to obtain a clearance of approximately 1 mm.
5. Retighten the screws.

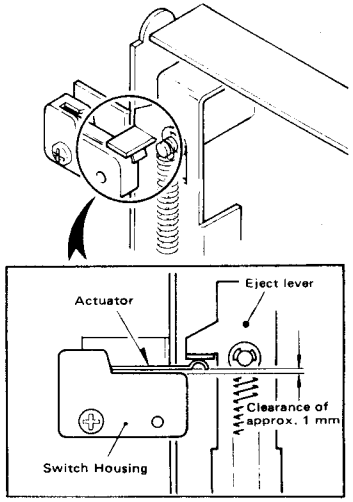


Fig. 4-8

4-9 LUBRICATION

Lubrication is only required when parts are replaced. For this purpose, use the oil and grease specified below.

Oil: TEAC spindle oil (from TEAC TZ-255 oil kit), Mobil D.T.E. Oil Light, or equivalent

Grease: ORE-LUBE G1/3 or equivalent

1. Apply a drop of oil with an oil applicator to a point about 1/3 the way down the shaft (from the free end) of the flywheel, then insert the shaft into the capstan housing.
2. Apply a suitable amount of light grease to the well of the flywheel bearing.

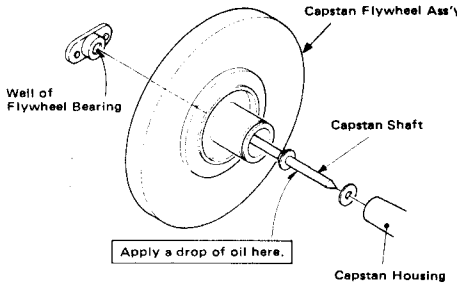


Fig. 4-9

4-10 VOLTAGE SELECTION (FOR GENERAL EXPORT MODELS)

1. Always disconnect the power line cord before making these adjustments.
2. Remove the top cover of the deck by removing the screws from the sides.
3. Locate the voltage selector, shown in the illustration (in front of the power transformer).
4. Loosen the two screws in the shorting bar and move the bar so that it jumpers the opposing terminals marked with the required voltage (100, 117, 220 or 240).
5. Retighten the screws and replace the top cover.

4-11 AC POWER LINE FREQUENCY

Since the C-3X uses a DC servo motor, 50 Hz or 60 Hz operation is permitted without any change in power line frequency.

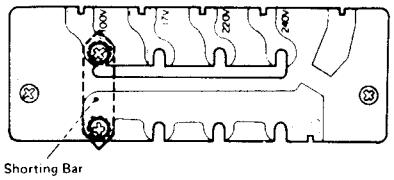


Fig. 4-10

5 ELECTRICAL ADJUSTMENTS AND CHECKS

PRECAUTIONS

1. Before beginning any checks or adjustments, clean and demagnetize the entire tape path.
2. Make sure the deck is properly set for the voltage in your locality.
3. In general, adjustments and checks are done in the order of L-ch then R-ch. Double REF. NOs. and test point designations indicate L-ch/R-ch.
   (Example: R11/R21)
4. For this deck, 0 dB is referenced to 0.775 V. If you are using an AC voltmeter which references 0 dB to 1 V, appropriate compensation should be made.
5. The AC voltmeter used in the procedures must have an input impedance of 1M ohms or more.
6. **Note the "Deck settings" at the top of each chart. These settings must be used for all the checks in each chart unless explicitly stated otherwise.**

–70 dB or more . . . What does it mean?

In reference to some specifications, you may come across an expression like: "–70 dB or more". This means that the lower the value of this specification, the greater the absolute value of the specification and the better the performance of the deck. For instance, a noise floor of –76 dB is better than –70 dB, because this means that the level of noise is lower. So in this case, "–70 dB or more" means at least as good a value as –70 dB and maybe even better, i.e., –71 dB.

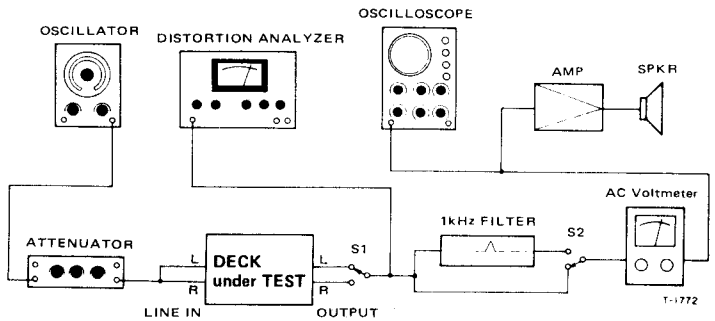


Fig. 5-1 Basic test setup

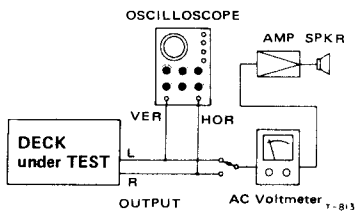


Fig. 5-2 Test setup for azimuth check

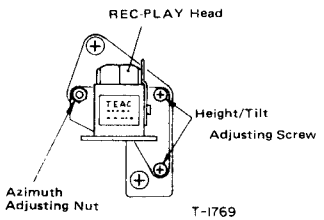


Fig. 5-3 Azimuth adj. nut location

Deck settings:
MONITOR sw.: TAPE
NR SYSTEM sw.: OUT
SPEED sw.: STANDARD
EQ sw.: METAL

TEAC test tapes:
MTT-150: For Dolby level calibration
MTT-316: For playback frequency response check for METAL, $Co(CrO_2)$
MTT-216: For playback response check for NORMAL

5-1 PLAYBACK PERFORMANCE

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
1. REC/PLAY head azimuth	Conn.: Fig. 5-2 OUTPUT cont.: convenient output level position	MTT-316 (12.5 kHz)	Azimuth nut of R-P heads (Fig. 5-3)	OUTPUT: • Phase: about 0° on 'scope (Fig. 5-4) • Max. output on VTVM	
2. Phase shift	Same as above	MTT-316	Check	OUTPUT: Phase: 45° min. (315 Hz) 90° min. (12.5 kHz)	
3. Specified output level	–	MTT-150	R11/R21	TP1/TP2 –2.5 dB (581 mV)	
	–	MTT-150	OUTPUT cont.	OUTPUT: –5 dB (436 mV)	• **Spec. setting of OUTPUT cont.** • Spec. output level
	IMPORTANT: Do not change the OUTPUT cont. setting after establishing the proper settings as above.				
4. PEAK LEVEL meter	–	MTT-150	R12/R22	PEAK LEVEL meter: 0 dB	
5. Frequency response	EQ: METAL, $Co(CrO_2)$ Adjust for 10 kHz to be the same level as ref. signal (315 Hz)	MTT-316	R10/R20	OUTPUT: Fig. 5-9	
	EQ: NORMAL	MTT-316	Check	OUTPUT: At 10 kHz, should be 3 dB to 6 dB higher than measured in above step.	
6. Signal-to-noise ratio	SPEED: STANDARD and HIGH EQ: METAL . . . . . / $Co(CrO_2)$ . . . . . / NORMAL	Fully-erased tape: (Use bulk tape eraser) METAL . . . . . / MTT-5061 . . . . . / MTT-501	Check	OUTPUT: 52 dB min. (STD) / 55 dB min. (HI) 48 dB min. (STD) / 53 dB min. (HI)	Ratio of spec. output of –5 dB to noise
7. Headphone output level	Conn.: Fig. 5-5	MTT-150	Check	PHONES: –15.8 dB ±3 dB (89.0 mV to 178 mV)	8 ohm load

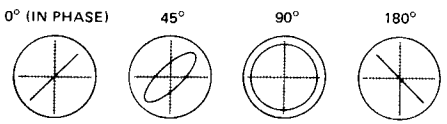


Fig. 5-4 Confirming phase relationship

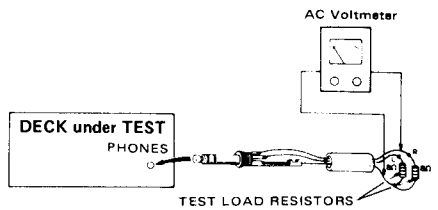


Fig. 5-5 Test setup for headphone check

Deck setting:
REC-PAUSE mode
MONITOR sw.: SOURCE
NR SYSTEM sw.: OUT
INPUT sw.: LINE
OUTPUT cont.: Specified position (item 3)

5-2 MONITOR PERFORMANCE

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
8. Min. input level	RECORD cont.: Max INPUT sw.: MIC	MIC: 400 Hz/–67 dB (346 μV)	Check	OUTPUT: –5 dB ±3 dB (308 mV to 615 mV)	MIC min. input level
	↓ INPUT sw.: LINE	LINE IN: 400 Hz/–19 dB (86.9 mV)	Check	OUTPUT: –5 dB ±3 dB (308 mV to 615 mV)	LINE min. input level
9. LINE specified input level	–	LINE IN: 400 Hz/–9 dB (275 mV)	RECORD cont. (L/R)	OUTPUT: –5 dB (436 mV)	Specified setting of RECORD cont.
	–	LINE IN: 400 Hz/–9 dB (275 mV)	Check	DOLBY TP (TP1/TP2): –2.5 dB ±0.5 dB (548 mV to 615 mV)	
	IMPORTANT: Do not change the setting of the RECORD or OUTPUT controls, after establishing their setting as above.				
10. PEAK LEVEL meter	–	LINE IN: 400 Hz/–9 dB (275 mV)	Check	PEAK LEVEL meter: 0 dB ±1 dB	
11. "TEST IN"	INPUT sw.: TEST	LINE IN: 400 Hz/–29 dB (27.5 mV)	Check	PEAK LEVEL meter: 0 dB ±2 dB	

Deck settings:
MONITOR sw.: TAPE
NR SYSTEM sw.: OUT
INPUT sw.: LINE
SPEED sw.: STANDARD
ADJUST/PRE-SET sw.: PRE-SET
OUTPUT cont.: Specified position (item 3)
RECORD cont. (L/R): Specified position (item 9)

TEAC test tapes:
MTT-5061: For record test with $Co(CrO_2)$
MTT-501: For record test with NORMAL
METAL: For record test with METAL

5-3 RECORDING PERFORMANCE

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
12. BIAS trap	Record-pause mode	LINE IN: No signal	L104/L204	BIAS TRAP TP (TP3/TP4): Min. reading	
13. Record bias	BIAS, EQ: METAL Tape: METAL	LINE IN: 400Hz & 10 kHz alternately/–42 dB (6.15 mV)	R15/R25	OUTPUT: Nearly equal level at both frequencies	
	BIAS, EQ: $Co(CrO_2)$ Tape: MTT-5061	LINE IN: 400 Hz & 10 kHz alternately/–42 dB (6.15 mV)	R14/R24	OUTPUT: Nearly equal level at both frequencies	
	BIAS, EQ: NORMAL Tape: MTT-501	LINE IN: 400 Hz & 10 kHz alternately/–42 dB (6.15 mV)	R13/R23	OUTPUT: Nearly equal level at both frequencies	

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
14. Record level	BIAS, EQ: METAL Tape: METAL	LINE IN: 400 Hz/–12 dB (195 mV)	R16/R26	OUTPUT: –8 dB (308 mV)	
	BIAS, EQ: $Co(CrO_2)$ Tape: MTT-5061	LINE IN: 400 Hz/–12 dB (195 mV)	R17/R27	OUTPUT: –8 dB (308 mV)	
	BIAS, EQ: NORMAL Tape: MTT-501	LINE IN: 400 Hz/–12 dB (195 mV)	R18/R28	OUTPUT: –8 dB (308 mV)	
15. Frequency response	SPEED: STANDARD and HIGH BIAS, EQ: METAL Tape: METAL	LINE IN: Required signal/ –42 dB (6.15 mV)	Check	OUTPUT: Fig. 5-10	
	BIAS, EQ: $Co(CrO_2)$ Tape: MTT-5061	LINE IN: Required signal/ –42 dB (6.15 mV)	Check	OUTPUT: Fig. 5-10	
	↓ BIAS, EQ: NORMAL Tape: MTT-501	LINE IN: Required signal/ –42 dB (6.15 mV)	Check	OUTPUT: Fig. 5-11	
	If frequency response is out of specification, recheck #13. "Record bias".				
16. Total harmonic distortion	Same as above, but with STANDARD tape only	LINE IN: 400 Hz/–12 dB (195 mV)	Check	OUTPUT: 2% or less distortion	
17. Signal-to-noise ratio	SPEED: STANDARD and HIGH BIAS, EQ: METAL Tape: METAL	LINE IN: 1 kHz/–9 dB (275 mV) ↓ no signal	Check	OUTPUT: 48 dB min. (STD) 49 dB min. (HI)	Ratio of specified output of –5 dB to noise
	BIAS, EQ: $Co(CrO_2)$ Tape: MTT-5061	LINE IN: 1 kHz/–9 dB (275 mV) ↓ no signal	Check	OUTPUT: 48 dB min. (STD) 49 dB min. (HI)	
	↓ BIAS, EQ: NORMAL Tape: MTT-501	LINE IN: 1 kHz/–9 dB (275 mV) ↓ no signal	Check	OUTPUT: 45 dB min. (STD) 46 dB min. (HI)	
18. Erase efficiency	• Connection is same as in Fig. 5-1, but engage 1-kHz filter. • Record a 1-kHz signal. Rewind tape to midpoint of recorded portion. Record a "no signal" portion. Find the difference between the 1-kHz portion and the "no-signal" portion.				
	BIAS, EQ: METAL Tape: METAL	LINE IN: 1 kHz/+1 dB (0.869 V) ↓ no signal	Check	OUTPUT: 65 dB min. ratio	Ref. output level: +5 dB (1.38V)
19. REC MUTE function	• Connection: Fig. 5-1, but engage 1-kHz filter. • Record a 1-kHz signal. Push REC MUTE button for several seconds. Rewind and play the tape. Find the difference between the 1-kHz portion and the "no-signal" portion.				
	BIAS, EQ: $Co(CrO_2)$ Tape: MTT-5061	LINE IN: 1 kHz/+1 dB (0.869 V) ↓ no signal	Check	OUTPUT: 65 dB min. ratio	Ref. output level: +5 dB (1.38 V)
20. Channel separation	• Connection: Fig. 5-1, but do not connect LINE IN (R), and engage 1-kHz filter. • Set the deck to record mode. Find the difference between the 1-kHz recorded portion (L-ch) and the "no signal" portion (R-ch).				
	BIAS, EQ: $Co(CrO_2)$ Tape: MTT-5061	LINE IN: L-ch 1 kHz/–9 dB (275 mV) R-ch No signal	Check	OUTPUT: 35 dB min. ratio	

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
21. Adjacent track crosstalk	• Connection: Fig. 5-1, but do not connect LINE IN (L) and OUTPUT (L). • Record a 125-Hz signal on R-ch and note output level. Invert tape and play R-ch track. Check leakage level against the output reference of previously recorded portion.				
	BIAS, EQ: Co(CrO_2) Tape: MTT-5061	LINE IN: L-ch No signal R-ch 125 Hz/−9 dB (275 mV)	Check	OUTPUT: 40 dB min. ratio	
22. DOLBY NR effect	• Record a 1-kHz signal with NR SYSTEM switch OUT. Play this portion with NR SYSTEM switch set to OUT and set to NR. Obtain the difference in output level between OUT and NR positions. Repeat the above process using a 10-kHz signal.				
	BIAS, EQ: Co(CrO_2) Tape: MTT-5061	LINE IN: 1 kHz/−29 dB (27.5 mV)	Check	OUTPUT: Variation 3 dB to 8 dB	
	BIAS, EQ: Co(CrO_2) Tape: MTT-5061	LINE IN: 10 kHz/−39 dB (8.69 mV)	Check	OUTPUT: Variation 8 dB to 12 dB	
23. Dolby HX effect (1)	BIAS, EQ: NORMAL Tape: MTT-501 NR SYSTEM: NR	LINE IN: Required signal/ −42 dB (6.15 mV)	Check	OUTPUT: Fig. 5-12	
(2)	NR SYSTEM: NR + HX	LINE IN: Required signal/ −42 dB (6.15 mV)	R36 (for L- and R-channels)	OUTPUT: Fig. 5-12	
(3)	NR SYSTEM: NR + HX	LINE IN: Required signal/ −12 dB (195 mV)	Check	OUTPUT: Fig. 5-13	
(4)	NR SYSTEM: OUT	LINE IN: Required signal/ −12 dB (195 mV)	Check	OUTPUT: At 10 kHz to 12.5 kHz, should be lower than measured in step (3).	
(5)	BIAS, EQ: Co(CrO_2) Tape: MTT-5061	Repeat steps (1) to (4), but substitute R37 for R36.			
24. BIAS/REC CALIBRATION (on front panel)	BIAS, EQ: Co(CrO_2) Tape: MTT-5061 INPUT: TEST ADJUST/PRE-SET sw.: ADJUST	R35/R45 trim-pot: fully CCW ( ) R30/R40 trim-pot: fully CW ( )			
	Record-pause mode MONITOR sw.: SOURCE	LINE IN: 1 kHz/−29 dB (27.5 mV)	RECORD cont's (L/R)	OUTPUT: −25 dB (43.6 mV)	
	Record-pause mode MONITOR sw.: SOURCE	LINE IN: 1 kHz/−29 dB (27.5 mV)	Check	PEAK LEVEL meter: 0 dB ±2 dB	
	Record-play mode MONITOR sw.: TAPE	LINE IN: 1 kHz/−29 dB (27.5 mV)	While rotating R35/R45 trim-pots clockwise, check that the difference in OUTPUT level between the setting where a maximum output value is obtained and when the trim-pot is set fully clockwise is more than 4 dB.		R35/R45 variable range checks
	Record-play mode MONITOR sw.: TAPE	LINE IN: 1 kHz/−29 dB (27.5 mV)	Set R35/R45 in the position corresponding to maximum output value. Check that, when R30/R40 is rotated from fully CW position to fully CCW position, OUTPUT level is reduced by more than 10 dB.		R30/R40 variable range checks
	Record-play mode MONITOR sw.: TAPE ↑ SOURCE ↓	LINE IN: 400 Hz/−29 dB (27.5 mV)	R30/R40	OUTPUT: Equal level with MONITOR switch, TAPE and SOURCE	
	Record-play mode MONITOR sw.: TAPE	LINE IN: 400 Hz/−29 dB 6.3 kHz/−29 dB 12.5 kHz/−29 dB	R35/R45	OUTPUT: Flat level between all 3 signals	

5-4 ADJUSTMENT AND TEST POINT LOCATIONS

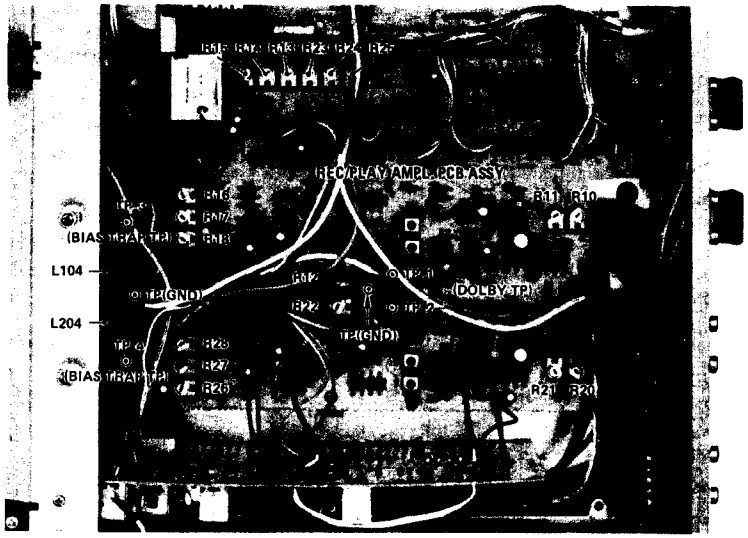


Fig. 5-6

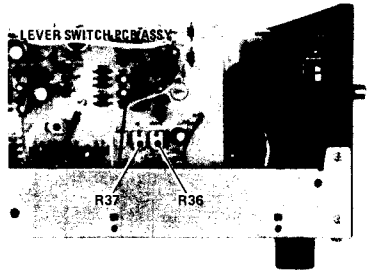


Fig. 5-7

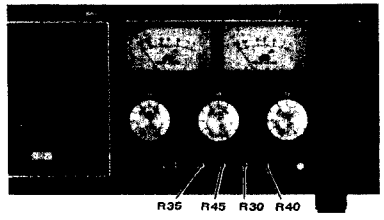
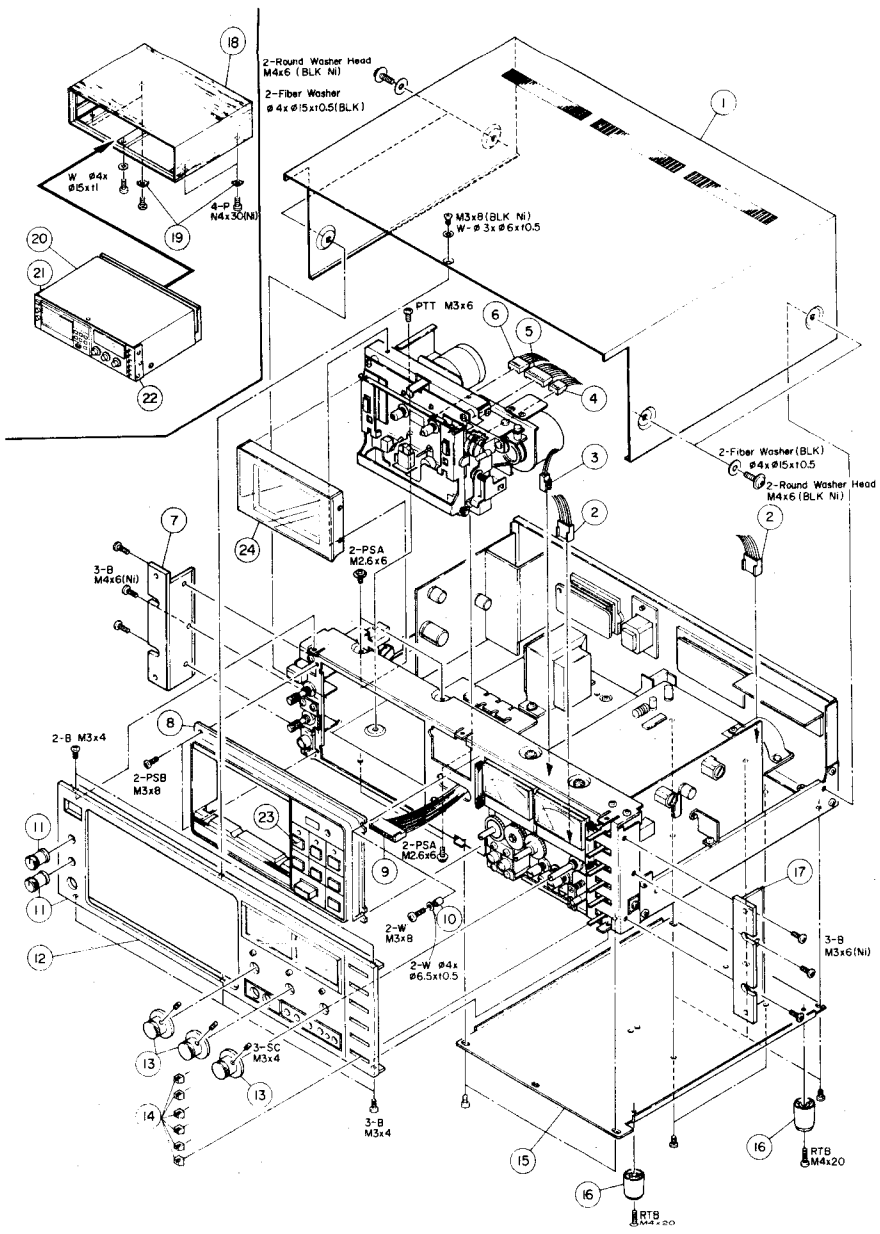


Fig. 5-8

R10/R20	Playback EQ
R11/R21	Playback level
R12/R22	PEAK LEVEL meter
R13/R23	Record bias (NORMAL)
R14/R24	Record bias [Co(CrO_2)]
R15/R25	Record bias (METAL)
R16/R26	Record level (METAL)
R17/R27	Record level [Co(CrO_2)]
R18/R28	Record level (NORMAL)
R30/R40	Record level (coarse-adjusted for general setting)
R35/R45	Record bias (coarse-adjusted for general setting)
R36	DOLBY HX effect (NORMAL)
R37	DOLBY HX effect [Co(CrO_2)]
L104/L204	Bias trap

6 EXPLODED VIEWS AND PARTS LIST

EXPLODED VIEW - 1



Parts marked with *require longer delivery time than regualr parts.

EXPLODED VIEW - 1

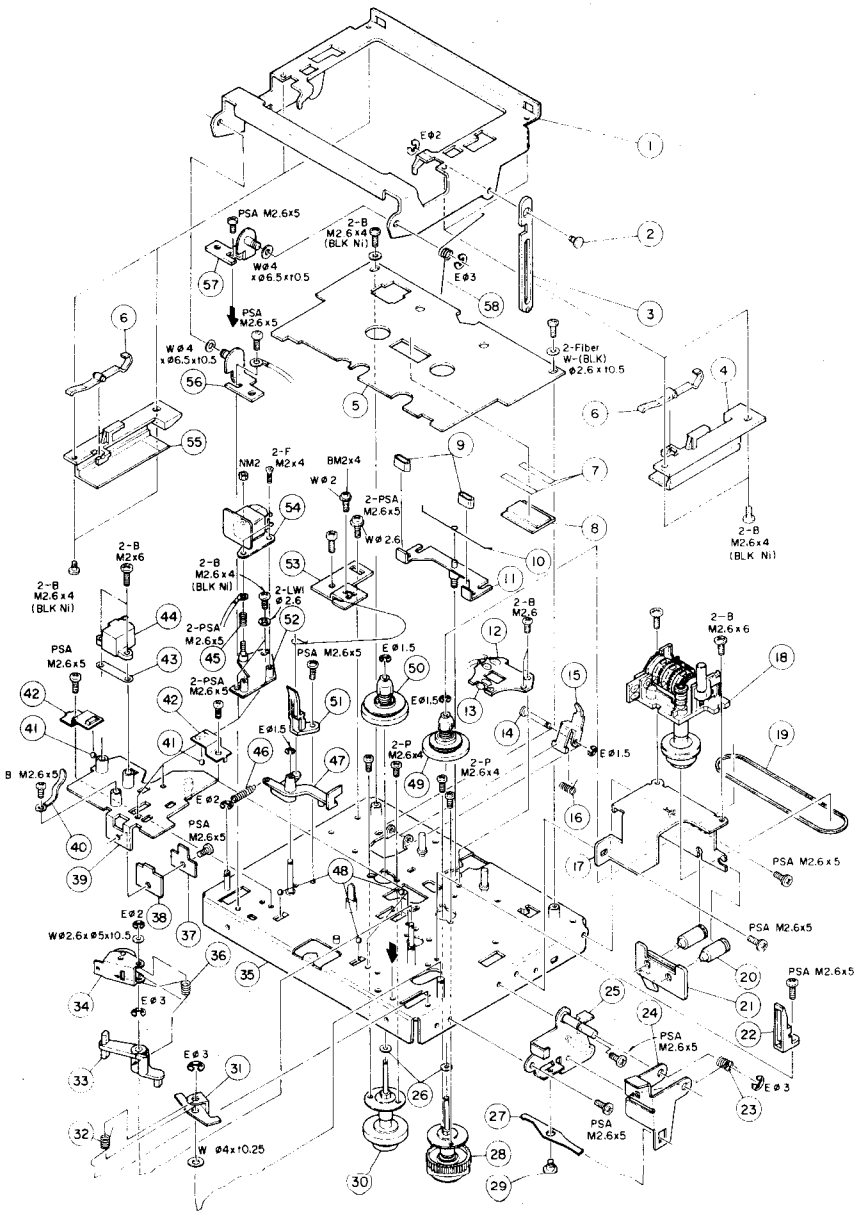
REF. NO.	PARTS NO.	DESCRIPTION
1 - 1	*5800060300	Cover, Top [All except L]
1 - 2	*5122168000	Connector, Socket; 6P
1 - 3	*5122165000	Connector, Socket; 3P
1 - 4	*5122166000	Connector, Socket; 4P
1 - 5	*5122172000	Connector, Socket; 10P
1 - 6	*5122167000	Connector, Socket; 5P
1 - 7	*5800059400	Bracket, Handle; L [All except L]
1 - 8	*5800083400	Escutcheon Assy, Cassette
1 - 9	*5122174000	Connector, Socekt; 12P
1 - 10	*5785603025	Spacer
1 - 11	5504712000	Knob Assy, TIMER
1 - 12	*5640007300	Panel Assy, Front
1 - 13	5543027100	Knob, VR
1 - 14	5534521000	Knob, Lever Switch
1 - 15	*5552340201	Chassis, Rear [All except L]
	*5502229001	Chassis Assy, Rear [L]
1 - 16	*5504676000	Foot [All except L]
1 - 17	*5800059500	Bracket, Handle; R [All except L]
1 - 18	*5800064800	Cabinet Assy [L]
1 - 19	*5555526000	Washer [L]
1 - 20	*5800060400	Cover, Top; Shield [L]
1 - 21	*5800059800	Sash, Side; L [L]
1 - 22	*5800059900	Sash, Side; R [L]
1 - 23	5138009000	Key Unit
1 - 24	5503187000	Cover Assy, Cassette

INCLUDED ACCESSORIES

REF. NO.	PARTS NO.	DESCRIPTION
	5128065000	Cord Assy, Input-output Connection
	5101345000	Information Supplement, Cassette [U]
	5101495000	Information Supplement, Cassette [All except U]
	5740005000	Plate Assy, Side; B [All except L]
	5544995000	Washer x 4 [All except L]
	5534659000	Sapcer x 4 [All except L]
	5780215015	Screw, M5 x 15 (Ni) x 4 [All except L]
	5564682000	Seal, MEMORY [All except L]
	5700007200	C-3X Owner's Manual [U]
	5700007300	C-3X Owner's Manual [All except U]

[U]: U.S.A.
[A]: AUSTRALIA
[L]: LIMITED AREA
[C]: CANADA
[E]: EUROPE
[GE]: GENERAL EXPORT
[UK]: U.K.

EXPLODED VIEW - 2



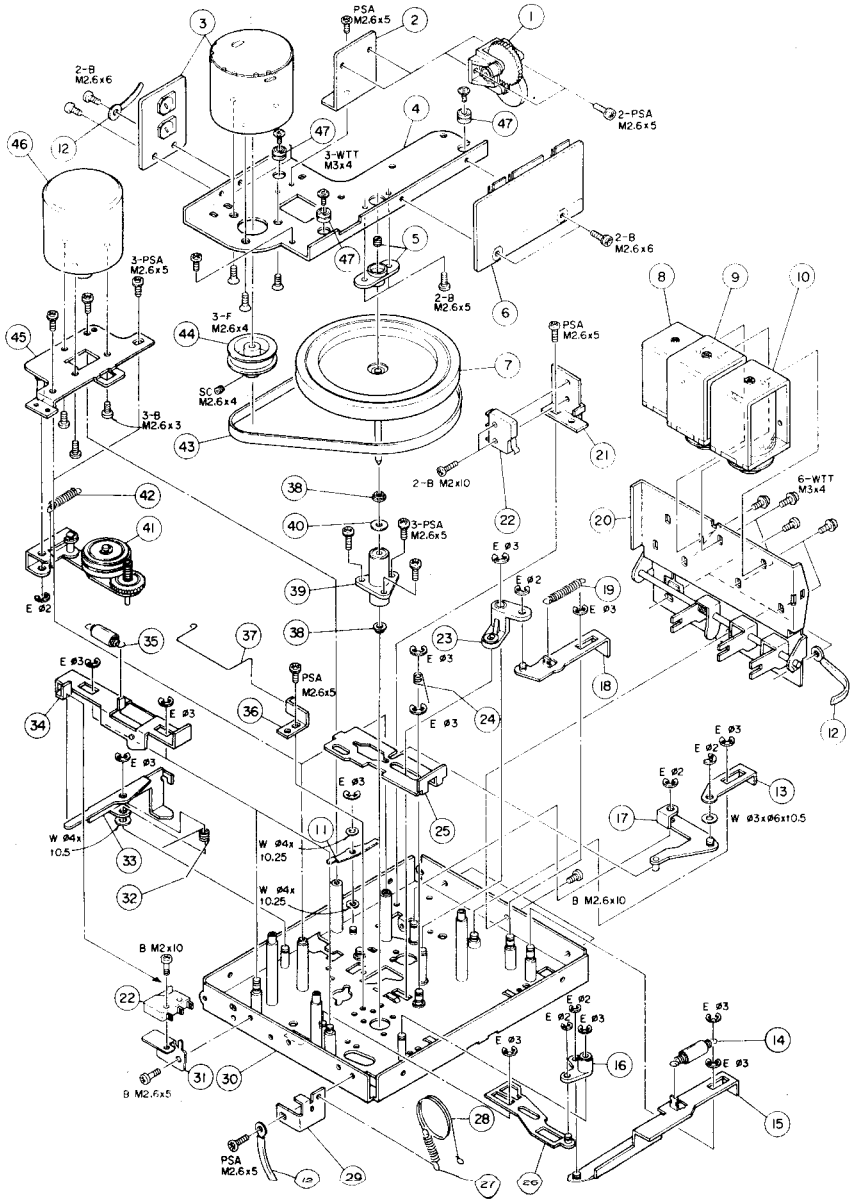
Parts marked with *require longer delivery time than regualr parts.

EXPLODED VIEW - 2

REF. NO.	PARTS NO.	DESCRIPTION
2 - 1	*5553285000	Holder, Cassette
2 - 2	*5544958000	Shaft, Lock Plate
2 - 3	*5534612000	Plate, Lock
2 - 4	*5534613000	Guide, Cassette; L
2 - 5	*5555655000	Plate, Cassette Holder
2 - 6	*5534615000	Spring, Cassette Pressure
2 - 7	*5555582000	Tape, Adhesive
2 - 8	*5534638000	Lens, Lamp
2 - 9	*5534844000	Shoe, Brake
2 - 10	*5520333000	Spring, Brake
2 - 11	*5504669002	Plate Assy, Brake; B
2 - 12	*5210010200	PCB, LAMP [U]
	*5210022400	PCB, LAMP [All except U]
2 - 13	5142026000	Lamp, DC 6V 65mA
2 - 14	*5544656000	Shaft, Lever
2 - 15	*5555544000	Lever, Record Preventing; D
2 - 16	*5524197000	Spring, Lever
2 - 17	*5555535000	Bracket, Counter Assy
2 - 18	5504660001	Counter Assy
2 - 19	5534617000	Belt, Counter
2 - 20	*5534448000	Mounting Rubber
2 - 21	*5200018410	PCB Assy, REED SW [All except U]
	*5200018400	PCB Assy, REED SW [U]
2 - 22	*5534444200	Guide, Cassette
2 - 23	*5524201000	Spring, Eject Arm
2 - 24	*5555551000	Arm, Eject
2 - 25	*5800090600	Holder Assy, Switch
2 - 26	*5800098500	Cushion, Reel
2 - 27	*5555552000	Arm, Eject Actuating
2 - 28	5800063800	Pulley Assy, Reel; R
2 - 29	*5581055000	Screw, Shoulder
2 - 30	5800063700	Pulley Assy, Reel; L
2 - 31	*5555549000	Arm, Eject Preventing
2 - 32	*5524200000	Spring, Arm
2 - 33	*5534606000	Arm, Pinch Roller
2 - 34	5504828001	Arm Assy, Pinch Roller
2 - 35	*5800060100	Chassis Assy, Mechanism
2 - 36	*5524285000	Spring, Pinch Roller
2 - 37	*5555531000	Plate, Head Base; B
2 - 38	*5555530000	Plate, Head Base; A
2 - 39	*5504717000	Plate Assy, Head Base
2 - 40	*5581062000	Clamper, Cord; E
2 - 41	5540055000	Steel Ball, ø2
2 - 42	*5555533000	Plate, Pressure
2 - 43	*5800064400	Spacer, Erase Head
2 - 44	5569613000	Head, Erase
2 - 45	5524141000	Spring, Height Adj.
2 - 46	*5524208000	Spring, Tension
2 - 47	*5533174000	Arm, Tension
2 - 48	5540056000	Steel Ball, ø3
2 - 49	5800063300	Table Assy, Reel; R
2 - 50	5800063200	Table Assy, Reel; L
2 - 51	5534683100	Guide, Cassette; L
2 - 52	*5504716000	Plate Assy, Head Mounting
2 - 53	*5555658000	Plate, Tension Adj.
2 - 54	5569606100	Head, REC-PLAY
2 - 55	5534614000	Guide, Cassette; R
2 - 56	*5504714000	Bracket Assy, Holder; L
2 - 57	*5504715000	Bracket Assy, Holder; R
2 - 58	*5524202000	Spring, Holder

[U]: U.S.A. [C]: CANADA [GE]: GENERAL EXPORT
[A]: AUSTRALIA [E]: EUROPE [UK]: U.K.
[L]: LIMITED AREA

EXPLODED VIEW - 3



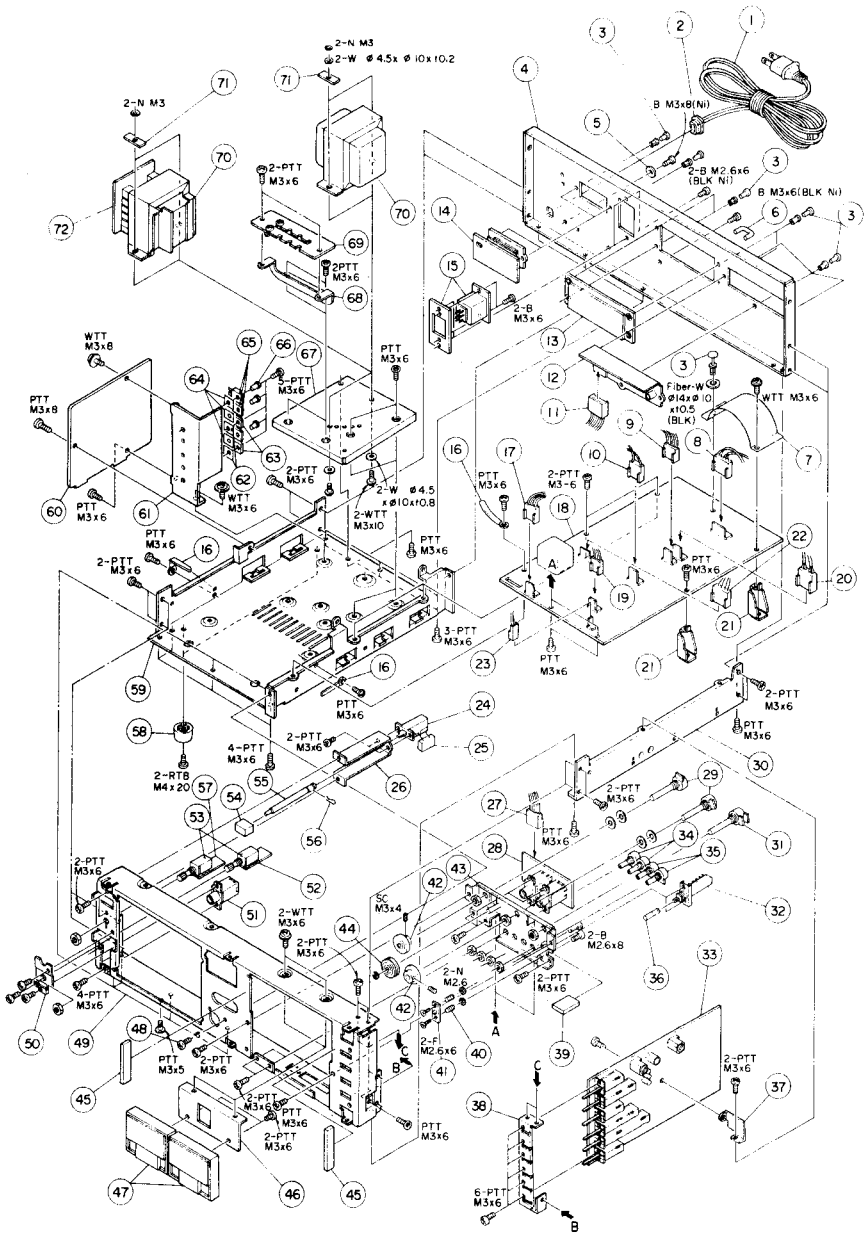
Parts marked with *require longer delivery time than regualr parts.

EXPLODED VIEW - 3

REF. NO.	PARTS NO.	DESCRIPTION
3 - 1	*5504673000	Holder Assy, Damper; C
3 - 2	*5555555000	Bracket, Damper
3 - 3	5370000600	Motor Assy, Capstan; DC
3 - 4	*5800064600	Plate, Flywheel Base
3 - 5	*5534277000	Bearing, Flywheel
3 - 6	*5200014100	PCB Assy, JOINT [U]
	*5200014110	PCB Assy, JOINT [All except U]
3 - 7	5504757000	Flywheel Assy, Capstan
3 - 8	5163040000	Solenoid, B
3 - 9	5163039100	Solenoid, A
3 - 10	5313000500	Solenoid
3 - 11	*5555546000	Arm, Pressure; B
3 - 12	*5581038000	Clamper, Cord; A
3 - 13	*5800062600	Lever, Actuating
3 - 14	*5524195000	Spring, Lever
3 - 15	*5504666000	Lever Assy, Pause Actuating
3 - 16	*5534611000	Arm, Pause Actuating
3 - 17	*5800061900	Arm Assy, Actuating
3 - 18	*5504665000	Lever Assy, Actuating
3 - 19	*5524213000	Spring, Actuating; A
3 - 20	*5800065500	Bracket Assy, Solenoid; B
3 - 21	*5555543000	Bracket, Switch
3 - 22	5130003000	Switch, Micro
3 - 23	*5534610000	Arm, Base Actuating
3 - 24	*5800062700	Spring, Pulley Guide
3 - 25	*5800062900	Plate, Pulley Guide
3 - 26	*5504667000	Lever Assy, Pause
3 - 27	*5524203000	Spring, Damper
3 - 28	*5788202100	String, Damper
3 - 29	*5555556000	Angle, Spring
3 - 30	*5800060100	Chassis Assy, Mechanism
3 - 31	*5800062300	Bracket, Switch
3 - 32	*5800062800	Spring, Cassette Pressure
3 - 33	*5800061600	Arm, Cassette Pressure
3 - 34	*5504670000	Lever Assy, Eject
3 - 35	*5524199000	Spring, Eject
3 - 36	*5800063000	Guide, Actuating Bar
3 - 37	*5800062500	Bar, Brake Actuating
3 - 38	*5534130000	Washer, Oil Retaining
3 - 39	*5504091000	Housing Assy, Capstan
3 - 40	*5550031000	Washer Thrust
3 - 41	5504808000	Pulley Assy, Fast Wind
3 - 42	*5524274000	Spring, Arm
3 - 43	5800063100	Belt, Capstan Drive
3 - 44	5800062400	Pulley, Motor
3 - 45	*5504807001	Plate Assy, Motor
3 - 46	7105135000	Motor Assy, Reel; DC
3 - 47	*5534537000	Collar, Rubber

[U]: U.S.A. [C]: CANADA [GE]: GENERAL EXPORT
[A]: AUSTRALIA [E]: EUROPE [UK]: U.K.
[L]: LIMITED AREA

EXPLODED VIEW - 4



Parts marked with *require longer delivery time than regualr parts.

EXPLODED VIEW - 4

REF. NO.	PARTS NO.	DESCRIPTION
4 - 1	⚠5128034000	Cord, AC Power [GE, L]
	⚠5128075000	Cord, AC Power [U, C]
	⚠5128017000	Cord, AC Power [E]
	⚠5128036000	Cord, AC Power [UK]
	⚠5350008300	Cord, AC Power [A]
4 - 2	*5534660000	Strain Relief, AC Power Cord [All except UK]
	*5534661000	Strain Relief, AC Power Cord [UK]
4 - 3	5534118000	Rivet, Push
4 - 4	*5552381000	Panel, Rear
4 - 5	*5555063000	Washer, GND
4 - 6	*5330505000	Plug, 2P; Shorting
4 - 7	*5800088000	Cover, Shield
4 - 8	*5122225000	Connector, Socket; 6P (BLK)
4 - 9	*5122282000	Connector, Socket; 4P (RED)
4 - 10	*5122166000	Connector, Socket; 4P (WHT)
4 - 11	*5122167000	Connector, Socket; 5P (WHT)
4 - 12	*5200013400	PCB Assy, IN/OUTPUT [U]
	*5200013410	PCB Assy, IN/OUTPUT [All except U]
4 - 13	*5200013300	PCB Assy, IN/OUTPUT (DBX) [U]
	*5200013310	PCB Assy, IN/OUTPUT (DBX) [All except U]
4 - 14	*5200013500	PCB Assy, REMOTE [U]
	*5200013510	PCB Assy, REMOTE [All except U]
4 - 15	*5620013700	Socket Assy, 6P
4 - 16	*5581038000	Clamper, Cord; A
4 - 17	*5122169000	Connector, Socket; 7P (WHT)
4 - 18	*5200013100	PCB Assy, REC-PLAY AMPL [U]
	*5200013110	PCB Assy, REC-PLAY AMPL [All except U]
4 - 19	*5122165000	Connector, Socket; 3P (WHT)
4 - 20	*5122284000	Connector, Socket; 6P (RED)
4 - 21	*5555565200	Angle, PCB
4 - 22	*5122223000	Connector, Socket; 4P (BLK)
4 - 23	*5122164000	Connector, Socket; 2P (WHT)
4 - 24	⚠5134018000	Switch, Power [U, C]
	⚠5134011000	Switch, Power [E, UK, A]
	⚠5134009000	Switch, Power [GE, L]
4 - 25	⚠5052906000	Spark Killer, 0.033 μF + 120Ω/250V [U]
	⚠5052907000	Spark Killer, 0.01 μF + 300Ω/400V [GE, L]
	⚠5052911000	Spark Killer, 0.033 μF + 120Ω/250V [C]
	⚠5267702500	Spark Killer, 0.0047 μF/250V [E, UK, A]
4 - 26	*5555561000	Bracket, Power Switch
4 - 27	*5122168000	Connector, Socket; 6P (WHT)
4 - 28	*5200013201	PCB Assy, MIC JACK [U]
	*5200013210	PCB Assy, MIC JACK [All except U]
4 - 29	5150223000	Var. Res., 100kΩ(A)
4 - 30	*5553269101	Chassis, L
4 - 31	5282406302	Var. Res., 20kΩ x 2 (A)
4 - 32	*5300019500	Switch, Push; 6-2
4 - 33	*5200013900	PCB Assy, SW [U]
	*5200013910	PCB Assy, SW [All except U]
4 - 34	5282250201	Var. Res., 250kΩ(B)
4 - 35	5282250101	Var. Res., 50kΩ(B)
4 - 36	5504713000	Knob, Push Switch; K
4 - 37	*5800059300	Bracket, SW PCB
4 - 38	*5555646000	Bracket, Lever Switch

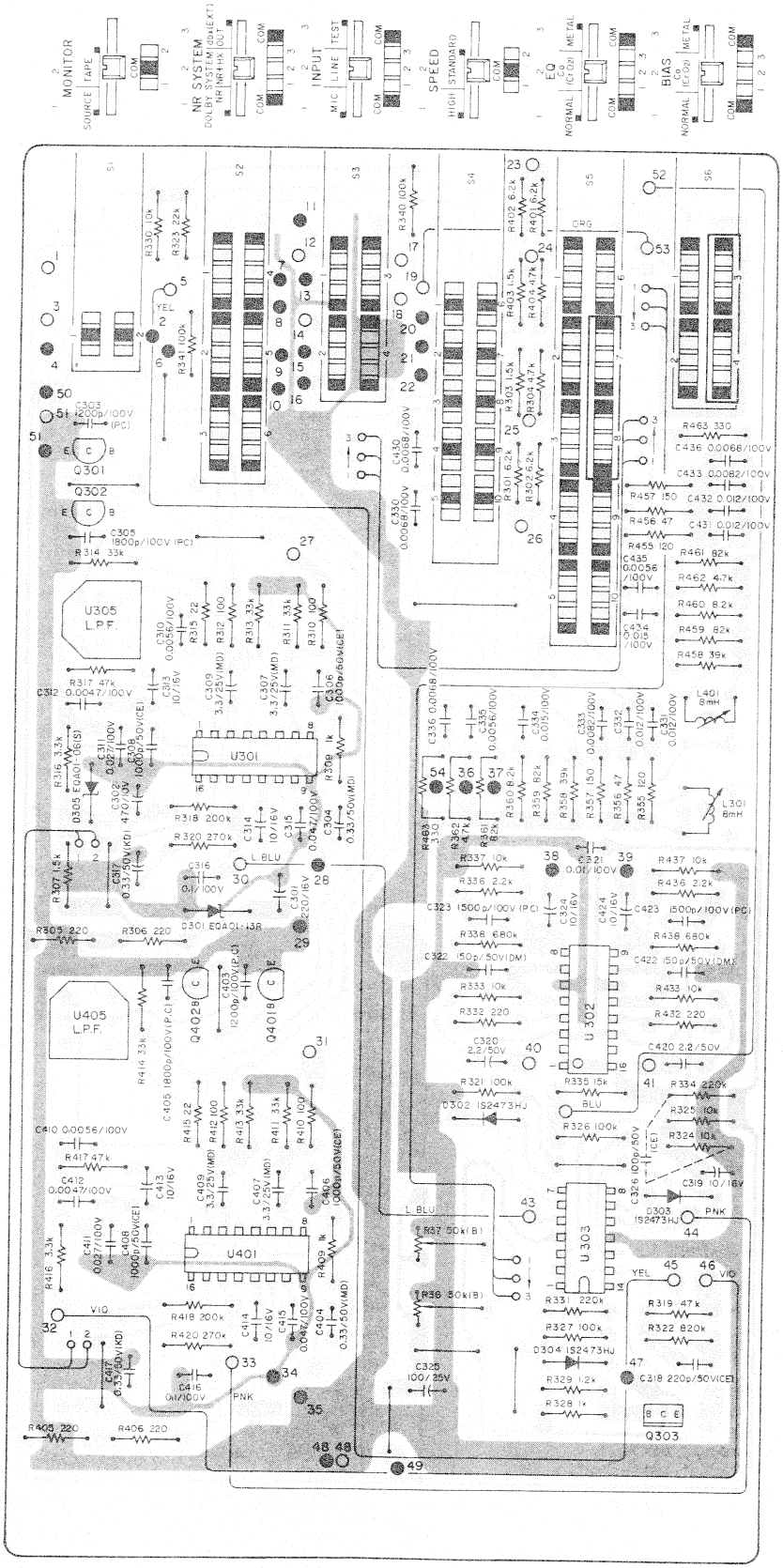
REF. NO.	PARTS NO.	DESCRIPTION
4 - 39	*5555913000	Mask, C
4 - 40	*5524082000	Spring, LED; B
4 - 41	*5168899000	PCB Assy, LED
4 - 42	*5504568000	Gear Assy, A
4 - 43	*5504710001	Bracket, Var. Res.
4 - 44	*5504569200	Gear Assy, Friction
4 - 45	*5555912000	Mask, B
4 - 46	*5554653200	Bracket, Meter
4 - 47	5165053100	Meter, Peak Level
4 - 48	*5524124000	Spring, GND
4 - 49	*5800064900	Chassis, Front
4 - 50	*5800059200	Bracket, Switch
4 - 51	5124022000	Jack, PHONES
4 - 52	*5200013700	PCB Assy, SW (MEMORY) [U]
	*5200013710	PCB Assy, SW (MEMORY) [All except U]
4 - 53	5133019000	Switch, Rotary; 2-3
4 - 54	5534431000	Button, B
4 - 55	*5534422100	Rod, Power Switch
4 - 56	*5786360500	R Pin, ϕ5
4 - 57	*5200013600	PCB Assy, SW (TIMER) [U]
	*5200013610	PCB Assy, SW (TIMER) [All except U]
4 - 58	*5504676000	Foot
4 - 59	*5551031200	Chassis, R [All except L]
	*5502228000	Chassis Assy, R [L]
4 - 60	*5200014002	PCB Assy, POWER SUPPLY [U]
	*5200014012	PCB Assy, POWER SUPPLY [All except U]
4 - 61	*5555951001	Heat Sink
4 - 62	*5033291000	Plate, Insulating
4 - 63	5231755100	Transistor, 2SD880Y
4 - 64	*5317000300	Plate, Insulating
4 - 65	5231755500	Transistor, 2SD985
4 - 66	*5033295000	Tube, Insulating
4 - 67	*5553353100	Bracket, Transformer
4 - 68	*5555060000	Bracket, B [GE, L]
4 - 69	*5168548100	PCB Assy, VOLTAGE SELECTOR [GE, L]
4 - 70	⚠5152182100	Transformer, Power [U, C]
	⚠5152184000	Transformer, Power [E, UK, A]
	⚠5152215000	Transformer, Power [GE, L]
4 - 71	*5555626000	Washer, Transformer
4 - 72	*5168973200	PCB Assy, FUSE [E, UK, A]

[U]: U.S.A.
[A]: AUSTRALIA
[L]: LIMITED AREA
[C]: CANADA
[E]: EUROPE
[GE]: GENERAL EXPORT
[UK]: U.K.

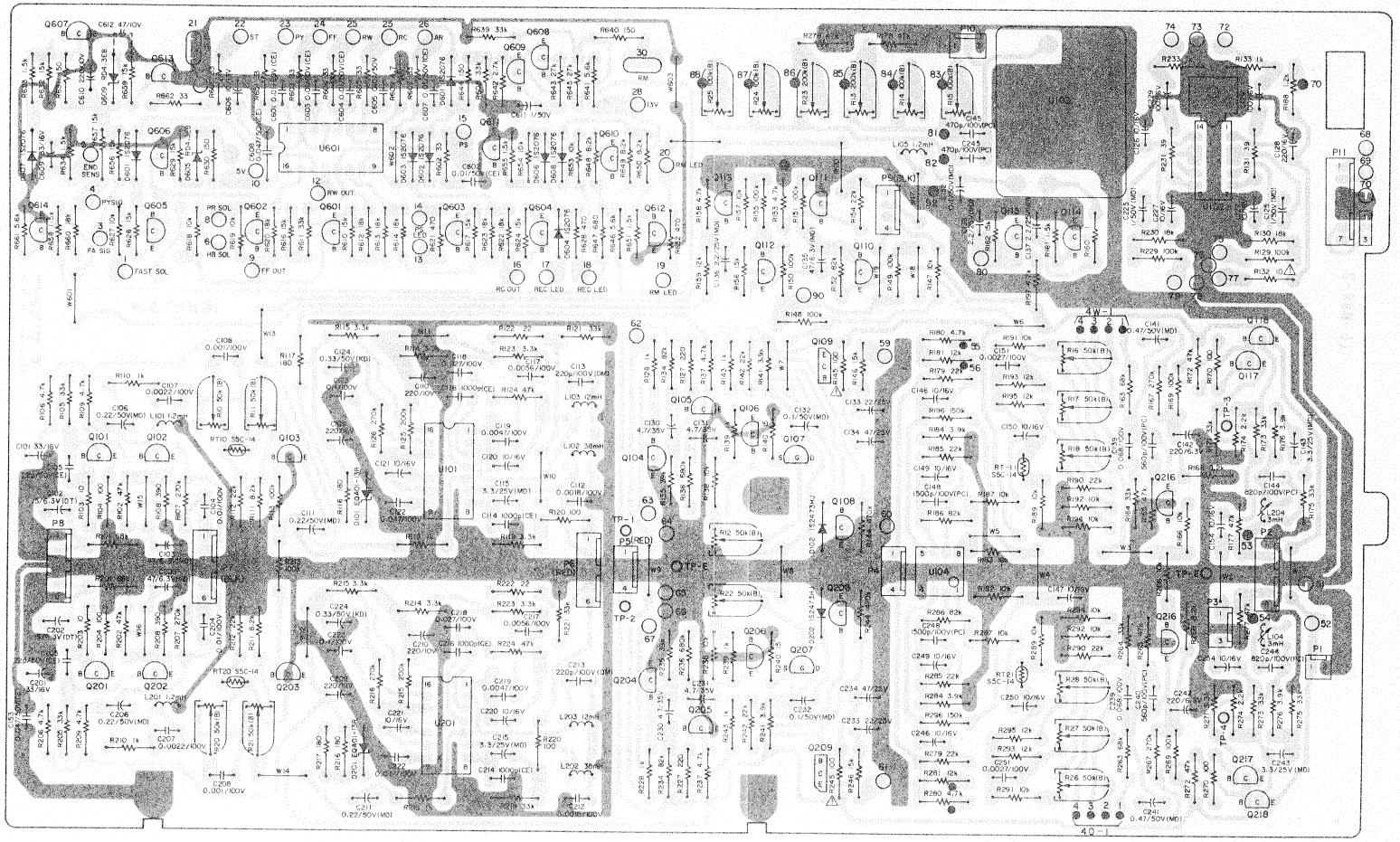
7 PC BOARDS AND PARTS LIST

PC Boards shown viewed from foil side

LEVER SWITCH PCB ASSY



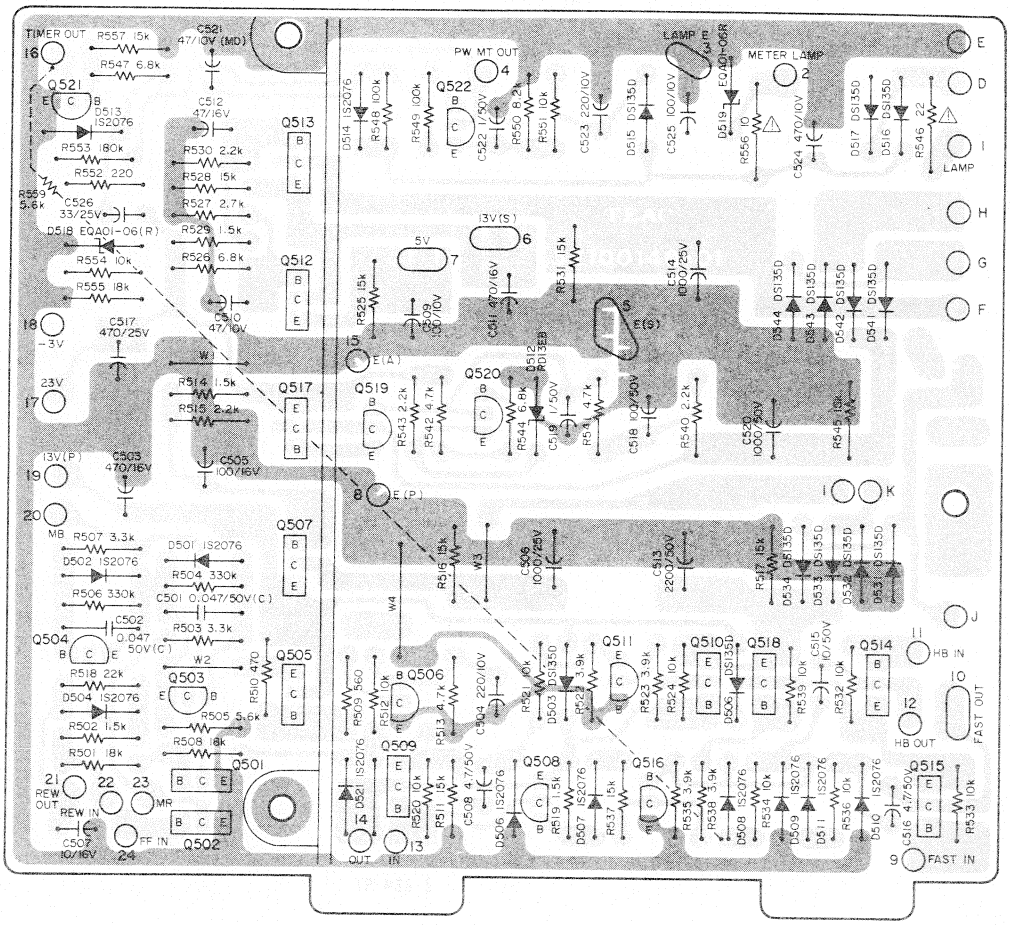
REC/PLAY AMPL PCB ASSY



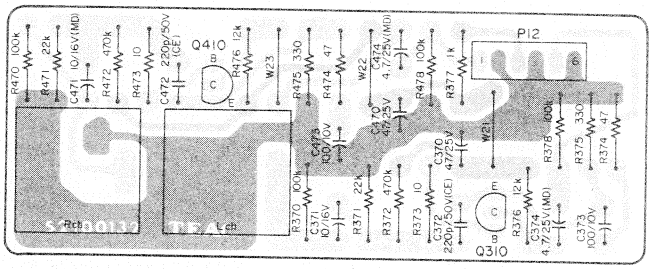
NOTES

1. PC Boards shown viewed from foil side.
2. The colors used on the PCB illustrations have the following significance:
   - : +B power supply circuit
   - : −B power supply circuit
   - : GND
   - : Other
3. Resistor values are in ohms (k = 1,000 ohms).
4. All capacitor values are in microfarads (p = picofarads).

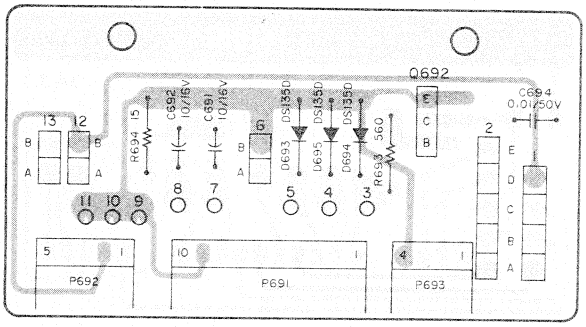
POWER SUPPLY PCB ASSY



MIC JACK PCB ASSY



JOINT PCB ASSY



LEVER SWITCH PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	5200013900	PCB Assy [U]
	5200013910	PCB Assy [All except U]
	5210013900	PCB [U]
	5210022000	PCB [All except U]
		IC's
U301, U401	5147040000	NE645B
U302	5220405200	LM13600
U303	5220405300	LM324
		TRANSISTORS
Q301, Q401	5145178000	2SC1684S
Q302, Q402	5145178000	2SC1684S
Q303	5231755500	2SD985
		DIODES
D301	5143198000	Zener, EQA01-13R
D302 ~ D304	5143118000	1S2473HJ
D305	5143184000	Zener, EQA01-06S
		CARBON RESISTORS
		All resistors are rated ±5% tolerance and ¼watt.
R301, R401	5183101000	6.2kΩ
R302, R402	5183101000	6.2kΩ
R303, R403	5183086000	1.5kΩ
R304, R404	5183098000	4.7kΩ
R305, R405	5183066000	220Ω
R306	5183066000	220Ω
R307	5183086000	1.5kΩ
R309, R409	5183082000	1kΩ
R310, R410	5183058000	100Ω
R311, R411	5183118000	33kΩ
R312, R412	5183058000	100Ω
R313, R413	5183118000	33kΩ
R314, R414	5183118000	33kΩ
R315, R415	5183042000	22Ω
R316, R416	5183094000	3.3kΩ
R317, R417	5183122000	47kΩ
R318, R418	5173136000	200kΩ
R319, R419	5183122000	47kΩ
R320, R420	5183140000	270kΩ
R321	5183130000	100kΩ
R322	5183152000	820kΩ
R323	5183114000	22kΩ
R324, R325	5183106000	10kΩ
R326, R327	5183130000	100kΩ
R328	5183082000	1kΩ
R329	5183084000	1.2kΩ
R330	5183098000	4.7kΩ
R331	5183138000	220kΩ
R332, R432	5183066000	220Ω
R333, R433	5183106000	10kΩ
R334	5183138000	220kΩ
R335	5183110000	15kΩ
R336, R436	5183090000	2.2kΩ
R337, R437	5183106000	10kΩ
R338, R438	5183150000	680kΩ
R340, R341	5183130000	100kΩ
R355, R455	5183060000	120Ω
R356, R456	5183050000	47Ω
R357, R457	5183062000	150Ω
R358, R458	5183120000	39kΩ
R359, R459	5183128000	82kΩ
R360, R460	5183104000	8.2kΩ
R361, R461	5183128000	82kΩ
R362, R462	5183098000	4.7kΩ
R363, R463	5183070000	330Ω
		CAPACITORS
C301	5173054800	Elec. 220μF 16V
C302	5173071800	Elec. 470μF 10V
C303, C403	5173733000	Polypro. 0.0012μF 100V 5%
C304, C404	5173553800	Elec. 0.33μF 50V
C305, C405	5173735000	Polypro. 0.0018μF 100V 5%
C306, C406	5172324000	Ceramic 0.001μF 50V 10%
C307, C407	5173561800	Elec. 3.3μF 25V
C308, C408	5172324000	Ceramic 0.001μF 50V 10%
C309, C409	5173561800	Elec. 3.3μF 25V
C310, C410	5170419000	Mylar 0.0056μF 100V 5%
C311, C411	5170435000	Mylar 0.027μF 100V 5%
C312, C412	5170417000	Mylar 0.0047μF 100V 5%
C313, C413	5173010800	Elec. 10μF 16V
C314, C414	5173010800	Elec. 10μF 16V
C315, C415	5170441000	Mylar 0.047μF 100V 5%
C316, C416	5170449000	Mylar 0.1μF 100V 5%
C317, C417	5260225812	Elec. 0.33μF 50V 10%
C318	5172316000	Ceramic 220pF 50V 10%
C319	5173010800	Elec. 10μF 16V
C320, C420	5172996800	Elec. 2.2μF 50V
C321	5170425000	Mylar 0.01μF 100V 5%
C322, C422	5054330000	Dip. Mica 150pF 50V 10%
C323, C423	5173734000	Polypro. 0.0015μF 100V 5%
C324, C424	5173010800	Elec. 10μF 16V
C325	5173046800	Elec. 100μF 25V
C326	5172312000	Ceramic 100pF 50V 10%
C330, C430	5170421000	Mylar 0.0068μF 100V 5%
C331, C431	5170427000	Mylar 0.012μF 100V 5%
C332, C432	5170427000	Mylar 0.012μF 100V 5%
C333, C433	5170423000	Mylar 0.0082μF 100V 5%
C334, C434	5170429000	Mylar 0.015μF 100V 5%
C335, C435	5170419000	Mylar 0.0056μF 100V 5%
C336, C436	5170421000	Mylar 0.0068μF 100V 5%
		VARIABLE RESISTORS
R36, R37	5280004002	Semi-fixed 50kΩ(B)
		COILS
L301, L401	5286000400	Choke, 8mH; Variable
		SWITCHES
S1	5300510200	Lever, 2-2
S2	5300510700	Lever, 6-3
S3	5300510600	Lever, 4-3
S4	5300511500	Lever, 10-2
S5	5300511600	Lever, 10-3
S6	5300510600	Lever, 4-3
		MISCELLANEOUS
U305, U405	5292802600	Filter, Low-pass

[U]: U.S.A. [C]: CANADA [GE]: GENERAL EXPORT
[A]: AUSTRALIA [E]: EUROPE [UK]: U.K.
[L]: LIMITED AREA

REC-PLAY AMPL PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	5200013100	PCB Assy [U]
	5200013110	PCB Assy [All except U]
	5210013100	PCB [U]
	5210021200	PCB [All except U]
		IC's
U101, U201	5147040000	NE645B
U102	5147074000	LA4170
U104	5147024000	JRC4558DF
U601	5147047000	M54410P
		TRANSISTORS
Q101, Q201	5145119000	2SC1844F
Q102, Q202	5042461000	2SC1327T
Q103, Q203	5145185000	2SD655E
Q104, Q204	5145086000	2SC1636-2
Q105, Q205	5042461000	2SC1327T
Q106, Q206	5145178000	2SC1684S
Q107, Q207	5145183000	FET, 2SK68AMI
Q108, Q208	5145086000	2SC1636-2
Q109, Q209	5145110000	2SC1637-1
Q110	5145132000	2SA933LNS
Q111	5145178000	2SC1684S
Q112	5145132000	2SA933LNS
Q113	5145178000	2SC1684S
Q114	5145082000	2SC2060Q
Q115	5145178000	2SC1684S
Q116, Q216	5145185000	2SD655E
Q117, Q217	5145178000	2SC1684S
Q118, Q218	5145132000	2SA933LNS
Q601, Q602	5230770700	2SC1841E
Q603, Q604	5145091000	2SC945AK
Q605	5230770700	2SC1841E
Q606 ~ Q609	5145091000	2SC945AK
Q610	5042553000	2SA733P
Q611 ~ Q614	5145091000	2SC945AK
		DIODES
D101, D201	5143198000	Zener, EQA01-13RF
D102, D202	5143118000	1S2473HJ
D601 ~ D604	5224012510	1S2076
D605	5143143000	Zener, RD4.3E
D606 ~ D608	5224012510	1S2076
D609	5143143000	Zener, RD4.3E
D610	5224012510	1S2076
		CARBON RESISTORS
		All resistors are rated ±5% tolerance and ¼ watt.
R101, R201	5183126000	68kΩ
R102, R202	5183122000	47kΩ
R103, R203	5183034000	10Ω
R104, R204	5183058000	100Ω
R105, R205	5183118000	33kΩ
R106, R206	5183098000	4.7kΩ
R107, R207	5183140000	270kΩ
R108, R208	5183072000	390Ω
R109, R209	5183098000	4.7kΩ
R110, R210	5183082000	1kΩ
R111, R211	5183104000	8.2kΩ
R112, R212	5183114000	22kΩ
R113, R213	5183130000	100kΩ
R114, R214	5183094000	3.3kΩ
R115, R215	5183094000	3.3kΩ
R116, R216	5183064000	180Ω
R117, R217	5183064000	180Ω
R118, R218	5183082000	1kΩ
R119, R219	5183118000	33kΩ
R120, R220	5183058000	100Ω
R121, R221	5183118000	33kΩ
R122, R222	5183042000	22Ω
R123, R223	5183094000	3.3kΩ
R124, R224	5183122000	47kΩ
R125, R225	5183137000	200kΩ
R126, R226	5183140000	270kΩ
R127, R227	5183066000	220Ω
R128, R228	5183082000	1kΩ
R129, R229	5183130000	100kΩ
R130, R230	5183112000	18kΩ
R131, R231	5183048000	39Ω
R132	5184225000	10Ω, Non Flammable
R133, R233	5183082000	1kΩ
R134, R234	5183128000	82kΩ
R135, R235	5183120000	39kΩ
R136, R236	5183150000	680kΩ
R137, R237	5183098000	4.7kΩ
R138, R238	5183106000	10kΩ
R139, R239	5183082000	1kΩ
R140, R240	5183038000	15Ω
R141, R241	5183096000	3.9kΩ
R142, R242	5183114000	22kΩ
R143, R243	5183082000	1kΩ
R144, R244	5183146000	470kΩ
R145, R245	5184249000	100Ω, Non Flammable
R146, R246	5183110000	15kΩ
R147	5183106000	10kΩ
R148 ~ R151	5183130000	100kΩ
R152	5183128000	82kΩ
R153	5183098000	4.7kΩ
R154	5183114000	22kΩ
R155	5183130000	100kΩ
R156	5183110000	15kΩ
R157	5183106000	10kΩ
R158	5183098000	4.7kΩ
R159	5183114000	22kΩ
R160	5183010000	1Ω
R161	5183086000	1.5kΩ
R162	5183110000	15kΩ
R163, R263	5183126000	68kΩ
R164, R264	5183118000	33kΩ
R165, R265	5183122000	47kΩ
R166, R266	5183106000	10kΩ
R167, R267	5183138000	220kΩ
R168, R268	5183104000	8.2kΩ
R169, R269	5183130000	100kΩ
R170, R270	5183058000	100Ω
R171, R271	5183094000	3.3kΩ
R172, R272	5183122000	47kΩ
R173, R273	5183118000	33kΩ
R174, R274	5183090000	2.2kΩ
R175, R275	5183118000	33kΩ
R176, R276	5183096000	3.9kΩ
R177, R277	5183122000	47kΩ
R178, R278	5183122000	47kΩ
R179, R279	5183114000	22kΩ
R180, R280	5183098000	4.7kΩ
R181, R281	5183108000	12kΩ

[U]: U.S.A. [C]: CANADA [GE]: GENERAL EXPORT
[A]: AUSTRALIA [E]: EUROPE [UK]: U.K.
[L]: LIMITED AREA

REF. NO.	PARTS NO.	DESCRIPTION
R182, R183	5183106000	10kΩ
R184, R284	5183096000	3.9kΩ
R185, R285	5183114000	22kΩ
R186, R286	5183128000	82kΩ
R187, R287	5183106000	10kΩ
R188	5183084000	1.2kΩ
R189, R289	5183106000	10kΩ
R190, R290	5183114000	22kΩ
R191, R291	5183106000	10kΩ
R192, R292	5183106000	10kΩ
R193, R293	5183108000	12kΩ
R194, R294	5183106000	10kΩ
R195, R295	5183108000	12kΩ
R196, R296	5183134000	150kΩ
R197	5183098000	4.7kΩ
R601 ~ R607	5183046000	33Ω
R608	5183118000	33kΩ
R609	5183026000	4.7Ω
R610	5183110000	15kΩ
R611	5183118000	33kΩ
R612 ~ R614	5183112000	18kΩ
R616, R617	5183110000	15kΩ
R618, R619	5183106000	10kΩ
R620	5183112000	18kΩ
R621	5183074000	470Ω
R622, R623	5183112000	18kΩ
R624	5183110000	15kΩ
R626	5183086000	1.5kΩ
R627	5183106000	10kΩ
R628	5183074000	470Ω
R629	5183110000	15kΩ
R630, R631	5183062000	150Ω
R632	5183110000	15kΩ
R633, R634	5183086000	1.5kΩ
R639	5183118000	33kΩ
R640	5183062000	150Ω
R641	5183100000	5.6kΩ
R642	5183092000	2.7kΩ
R643	5183116000	27kΩ
R644	5183062000	150Ω
R645	5183116000	27kΩ
R646	5183100000	5.6kΩ
R647	5183078000	680Ω
R648 ~ R650	5183104000	8.2kΩ
R651	5183086000	1.5kΩ
R652	5183074000	470Ω
R653, R654	5183106000	10kΩ
R655	5183086000	1.5kΩ
R656, R657	5183110000	15kΩ
R658	5183086000	1.5kΩ
R659	5183110000	15kΩ
R660	5183112000	18kΩ
R661	5183100000	5.6kΩ
R662	5183046000	33Ω

CAPACITORS

C101, C201	5173027800	Elec.	47μF	6.3V	
C102, C202	5171684000	Dip. Tant.	15μF	6.3V	
C103, C203	5173587800	Elec.	47μF	6.3V	
C104, C204	5170425000	Mylar	0.01μF	100V	5%
C105, C205	5172304000	Ceramic	22pF	50V	10%
C106, C206	5173552800	Elec.	0.22μF	50V	
C107, C207	5170409000	Mylar	0.0022μF	100V	5%

REF. NO.	PARTS NO.	DESCRIPTION			
C108, C208	5170401000	Mylar	0.001μF	100V	5%
C109, C209	5173054800	Elec.	220μF	16V	
C110, C210	5173053800	Elec.	220μF	10V	
C111, C211	5173552800	Elec.	0.22μF	50V	
C112, C212	5170407000	Mylar	0.0018μF	100V	
C113, C213	5054745000	Dip. Mica	220pF	50V	10%
C114, C214	5172324000	Ceramic	0.001μF	50V	10%
C115, C215	5173561800	Elec.	3.3μF	25V	
C116, C216	5172324000	Ceramic	0.001μF	50V	10%
C117, C217	5170419000	Mylar	0.0056μF	100V	5%
C118, C218	5170435000	Mylar	0.027μF	100V	5%
C119, C219	5170417000	Mylar	0.0047μF	100V	5%
C120, C220	5173010800	Elec.	10μF	16V	
C121, C221	5173010800	Elec.	10μF	16V	
C122, C222	5170441000	Mylar	0.047μF	100V	5%
C123, C223	5170449000	Mylar	0.1μF	100V	5%
C124, C224	5260225812	Elec.	0.33μF	50V	10%
C125, C225	5173556800	Elec.	1μF	50V	
C126	5173010800	Elec.	10μF	16V	
C127, C227	5173010800	Elec.	10μF	16V	
C128	5173054800	Elec.	220μF	16V	
C129, C229	5173044800	Elec.	100μF	10V	
C130, C230	5173005800	Elec.	4.7μF	35V	
C131, C231	5173005800	Elec.	4.7μF	35V	
C132, C232	5173550800	Elec.	0.1μF	50V	
C133, C233	5173019800	Elec.	22μF	25V	
C134, C234	5173037800	Elec.	47μF	25V	
C135	5173507800	Elec.	47μF	6.3V	
C136	5173560800	Elec.	2.2μF	50V	
C137	5173554800	Elec.	0.47μF	50V	
C138	5173560800	Elec.	2.2μF	50V	
C139, C239	5170455000	Mylar	0.18μF	100V	5%
C140, C240	5173729000	Polypro.	560pF	100V	5%
C141, C241	5173554800	Elec.	0.47μF	50V	
C142, C242	5173052800	Elec.	220μF	6.3V	
C143, C243	5173481800	Elec.	3.3μF	25V	
C144, C244	5173731000	Polypro.	820pF	100V	5%
C145, C245	5173728000	Polypro.	470pF	100V	5%
C146, C246	5173010800	Elec.	10μF	16V	
C147	5173010800	Elec.	10μF	16V	
C148, C248	5173734000	Polypro.	0.0015μF	100V	5%
C149, C249	5173010800	Elec.	10μF	16V	
C150, C250	5173010800	Elec.	10μF	16V	
C151, C251	5170411000	Mylar	0.0027μF	100V	5%
C152	5173550800	Elec.	0.1μF	50V	
C153	5172344000	Ceramic	0.047μF	50V	10%
C154, C254	5173010800	Elec.	10μF	16V	
C601 ~ C605	5172336000	Ceramic	0.01μF	50V	10%
C606	5173010800	Elec.	10μF	16V	
C607	5172336000	Ceramic	0.01μF	50V	10%
C608	5054230000	Ceramic	0.047μF	50V	10%
C609	5173027800	Elec.	33μF	16V	
C610	5173053800	Elec.	220μF	10V	
C611	5172992800	Elec.	1μF	50V	
C612	5173035800	Elec.	47μF	10V	

THERMISTORS

RT10, RT20	5143127000	S5C14
RT11, RT21	5143127000	S5C14

VARIABLE RESISTORS

R10, R20	5280004002	Semi-fixed	50kΩ(B)
R11, R21	5280004002	Semi-fixed	50kΩ(B)

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[GE]: GENERAL EXPORT
[UK]: U.K.

REF. NO.	PARTS NO.	DESCRIPTION
R12, R22	5280004002	Semi-fixed 50kΩ(B)
R13, R23	5280004302	Semi-fixed 200kΩ(B)
R14, R24	5280004202	Semi-fixed 100kΩ(B)
R15, R25	5280004202	Semi-fixed 100kΩ(B)
R16, R26	5280004002	Semi-fixed 50kΩ(B)
R17, R27	5280004002	Semi-fixed 50kΩ(B)
R18, R28	5280004002	Semi-fixed 50kΩ(B)

COILS

L101, L201	5160107000	Choke, 1200μH
L102, L202	5286001100	Choke, 38mH
L103, L203	5286001200	Trap, 12mH
L104, L204	5286001000	Choke, 3.1mH; Variable
L105	5160151000	Choke, 1.2mH

MISCELLANEOUS

U103	5292200300	OSC Unit, 100kHz
P1	5122126000	Connector Plug, 2P (WHT)
P2	5122130000	Connector Plug, 6P (WHT)
P3	5122127000	Connector Plug, 3P (WHT)
P4	5122128000	Connector Plug, 4P (WHT)
P5	5122301000	Connector Plug, 4P (RED)
P6	5122303000	Connector Plug, 6P (RED)
P7	5122187000	Connector Plug, 6P (BLK)
P8	5122130000	Connector Plug, 6P (WHT)
P9	5122185000	Connector Plug, 4P (BLK)
P10	5122127000	Connector Plug, 3P (WHT)
P11	5122131000	Connector Plug, 7P (WHT)

POWER SUPPLY PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	5200014001	PCB Assy [U]
	5200014011	PCB Assy [All except U]
	5210014001	PCB [U]
	5210022101	PCB [All except U]

TRANSISTORS

Q501, Q502	5231755500	2SD985
Q503, Q504	5145085000	2SA934R
Q505	5231755100	2SD880Y
Q506	5145091000	2SC945AK
Q507	5231755500	2SD985
Q508	5042553000	2SA733P
Q509, Q510	5230505300	2SB750
Q511	5230770700	2SC1841E
Q512, Q513	5231755500	2SD985
Q514, Q515	5230505300	2SB750
Q516	5230770700	2SC1841E
Q517	5231755100	2SD880Y
Q518	5230505300	2SB750
Q519 ~ Q521	5145091000	2SC945AK
Q522	5042553000	2SA733P

DIODES

D501, D502	5224012510	1S2076
D503	5224013210	DS135D
D504, D505	5224012510	1S2076
D506	5224013210	DS135D
D507 ~ D511	5224012510	1S2076
D512	5143059000	Zener, RD13EB
D513, D514	5224012510	1S2076
D515 ~ D517	5224013210	DS135D
D518, D519	5143153000	Zener, EQA01-06R
D521	5224012510	1S2076
D531 ~ D534	5224013210	DS135D
D541 ~ D544	5224013210	DS135D

CARBON RESISTORS

All resistors are rated ±5% tolerance and ¼ watt.

R501	5183112000	18kΩ
R502	5183086000	1.5kΩ
R503	5183094000	3.3kΩ
R504	5183142000	330kΩ
R505	5183100000	5.6kΩ
R506	5183142000	330kΩ
R507	5183094000	3.3kΩ
R508	5183112000	18kΩ
R509	5183076000	560Ω
R510	5183074000	470Ω
R511	5183110000	15kΩ
R512	5183104000	8.2kΩ
R513	5183098000	4.7kΩ
R514	5183086000	1.5kΩ
R515	5183090000	2.2kΩ
R516, R517	5183110000	15kΩ
R518	5183114000	22kΩ
R519	5183086000	1.5kΩ
R520, R521	5183106000	10kΩ
R522, R523	5183096000	3.9kΩ
R524	5183106000	10kΩ
R525	5183110000	15kΩ
R526	5183102000	6.8kΩ
R527	5183092000	2.7kΩ
R528	5183110000	15kΩ

[U]: U.S.A.
[A]: AUSTRALIA
[L]: LIMITED AREA
[C]: CANADA
[E]: EUROPE
[GE]: GENERAL EXPORT
[UK]: U.K.

REF. NO.	PARTS NO.	DESCRIPTION
R529	5183086000	1.5kΩ
R530	5183090000	2.2kΩ
R531	5183110000	15kΩ
R532 ~ R534	5183106000	10kΩ
R535	5183096000	3.9kΩ
R536	5183106000	10kΩ
R537	5183110000	15kΩ
R538	5183096000	3.9kΩ
R539	5183106000	10kΩ
R540	5183090000	2.2kΩ
R541, R542	5183098000	4.7kΩ
R543	5183090000	2.2kΩ
R544	5183102000	6.8kΩ
R545	5183110000	15kΩ
R546	5184233000	22Ω, Non Flammable
R547	5183102000	6.8kΩ
R548, R549	5183130000	100kΩ
R550	5183104000	8.2kΩ
R551	5183106000	10kΩ
R552	5183066000	220Ω
R553	5183136000	180kΩ
R554	5183106000	10kΩ
R555	5183112000	18kΩ
R556	5184225000	10Ω, Non Flammable
R557	5183110000	15kΩ
R559	5183310000	5.6kΩ
CAPACITORS		
C501, C502	5054230000	Ceramic 0.047μF 50V 10%
C503	5173072800	Elec. 470μF 16V
C504	5173053800	Elec. 220μF 10V
C505	5173045800	Elec. 100μF 16V
C506	5173082800	Elec. 1000μF 25V
C507	5173010800	Elec. 10μF 16V
C508	5173006800	Elec. 4.7μF 50V
C509	5173044800	Elec. 100μF 10V
C510	5173035800	Elec. 47μF 10V
C511	5173072800	Elec. 470μF 16V
C512	5173036800	Elec. 47μF 16V
C513	5173084800	Elec. 1000μF 50V
C514	5173082800	Elec. 1000μF 50V
C515	5173013800	Elec. 10μF 50V
C516	5173006800	Elec. 4.7μF 50V
C517	5173073800	Elec. 470μF 25V
C518	5173048800	Elec. 100μF 50V
C519	5172992800	Elec. 1μF 50V
C520	5173084800	Elec. 1000μF 50V
C521	5173588800	Elec. 47μF 10V
C522	5172992800	Elec. 1μF 50V
C523	5173053800	Elec. 220μF 10V
C524	5173071800	Elec. 470μF 10V
C525	5173044800	Elec. 100μF 10V
C526	5173028800	Elec. 33μF 25V
C527	5173084800	Elec. 1000μF 50V

MIC JACK PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	5200013200	PCB Assy [U]
	5200013210	PCB Assy [All except U]
	5210013200	PCB [U]
	5210021300	PCB [All except U]
TRANSISTORS		
Q310, Q410	5145119000	2SC1844F
CARBON RESISTORS All resistors are rated ±5% tolerance, ¼ watt.		
R370, R470	5183130000	100kΩ
R371, R471	5183114000	22kΩ
R372, R472	5183146000	470kΩ
R373, R473	5183034000	10Ω
R374, R474	5183050000	47Ω
R375, R475	5183070000	330Ω
R376, R476	5183108000	12kΩ
R377	5183082000	1kΩ
R378, R478	5183130000	100kΩ
CAPACITORS		
C370, C470	5173037800	Elec. 47μF 25V
C371, C471	5173571800	Elec. 10μF 16V
C372, C472	5172316000	Ceramic 220pF 50V 10%
C373, C473	5173044800	Elec. 100μF 10V
C374, C474	5173564800	Elec. 4.7μF 25V
MISCELLANEOUS		
J9	5122149000	Connector Plug, 6P

JOINT PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	5200014100	PCB Assy [U]
	5200014110	PCB Assy [All except U]
	5210014100	PCB [U]
	5210022300	PCB [All except U]
TRANSISTOR		
Q692	5230772100	2SC2270A-B
DIODES		
D693 ~ D695	5224013210	DS135D
CARBON RESISTORS		
R693	5183076000	560Ω 5% ¼W
R694	5183038000	15Ω 5% ¼W
CAPACITORS		
C691, C692	5173010800	Elec. 10μF 16V
	5172324000	Ceramic 0.001μF 50V 10%
MISCELLANEOUS		
P691	5122163000	Connector Plug, 10P (WHT)
P692	5122148000	Connector Plug, 5P (WHT)
P693	5122147000	Connector Plug, 4P (WHT)

[U]: U.S.A. [C]: CANADA [GE]: GENERAL EXPORT
[A]: AUSTRALIA [E]: EUROPE [UK]: U.K.
[L]: LIMITED AREA

IN/OUTPUT TERMINAL PCB ASSY (DBX) (PC Board Omitted)

REF. NO.	PARTS NO.	DESCRIPTION
	5200013300	PCB Assy [U]
	5200013310	PCB Assy [All except U]
	5210013300	PCB [U]
	5210021400	PCB [All except U]
R365, R465	5183118000	Resistor, Carbon 33kΩ 5% ¼W

REMOTE CONNECTOR PCB ASSY (PC Board Omitted)

REF. NO.	PARTS NO.	DESCRIPTION
	5200013500	PCB Assy [U]
	5200013510	PCB Assy [All except U]
	5210013500	PCB [U]
	5210021600	PCB [All except U]
	5122336000	Connector Socket, 12P

IN/OUTPUT TERMINAL PCB ASSY (PC Board Omitted)

REF. NO.	PARTS NO.	DESCRIPTION
	5200013400	PCB Assy [U]
	5200013410	PCB Assy [All except U]
	5210013400	PCB [U]
	5210021500	PCB [All except U]
R379, R479	5183120000	Resistor, Carbon 39kΩ 5% ¼W
P13	5122129000	Connector Plug, 5P (WHT)

REED SWITCH PCB ASSY (PC Board Omitted)

REF. NO.	PARTS NO.	DESCRIPTION
	5200018400	PCB Assy [U]
	5200018410	PCB Assy [All except U]
	5210018400	PCB [U]
	5210022500	PCB [All except U]
S693	5138006000	Switch, Reed
C693	5054802400	Capacitor, Mylar 0.01μF 100V 10%

SWITCH PCB ASSY (MEMORY) (PC Board Omitted)

REF. NO.	PARTS NO.	DESCRIPTION
	5200013700	PCB Assy (Memory) [U]
	5200013710	PCB Assy (Memory) [All except U]
	5210013700	PCB (Memory) [U]
	5210021800	PCB (Memory) [All except U]
Q691	5145981000	Transistor, 2SC945AK
R691	5183086000	Resistor, Carbon1.5kΩ 5% ¼W
R692	5183076000	Resistor, Carbon 560Ω 5% ¼W
S691	5133019000	Switch, Rotary; 2-3

SWITCH PCB ASSY (TIMER) (PC Board Omitted)

REF. NO.	PARTS NO.	DESCRIPTION
	5200013600	PCB Assy (Timer) [U]
	5200013610	PCB Assy (Timer) [All except U]
	5210013600	PCB (Timer) [U]
	5210021700	PCB (Timer) [All except U]
D691, D692	5224012510	Diode, 1S2076
S692	5133019000	Switch, Rotary; 2-3

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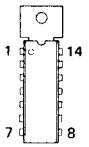
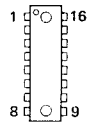
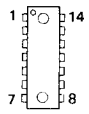
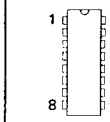
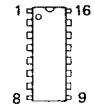
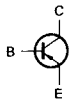
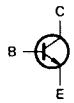
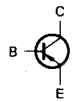
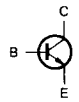
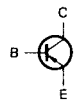
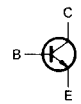
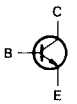
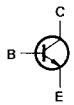
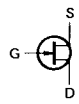
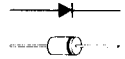
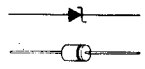
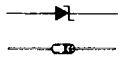
[A]: AUSTRALIA [E]: EUROPE [UK]: U.K.
[L]: LIMITED AREA

TABLE OF SEMICONDUCTORS

JRC4558DF (TOP VIEW)	LA4170 (TOP VIEW) 	LM13600 (TOP VIEW) 	LM324 (TOP VIEW) 	M54410P (TOP VIEW) 	NE645B (TOP VIEW) 
2SA733P 2SA933LNS 	2SC1327T 2SC1684S 2SC1841E 2SC1844F 2SC945AK 2SD655E 	2SA934R 	2SC2060Q 	2SB750 	2SD880Y 
2SC1636-2 2SC1637-1 	2SC2270A-B 2SD985 	2SK68AM1 	1S2076 1S2473HJ	DS135D 	
			EQA01-06R EQA01-06S EQA01-13RF 	RD4.3EB RD13EB 	
				SLP-114B	

BLOCK DIAGRAM